



LINEAR SHAFTS AND CUSTOMIZED PRECISION SHAFTS
FOR LINEAR MOTION SYSTEMS





LINEAR SHAFTS AND CUSTOMIZED PRECISION SHAFTS FOR LINEAR MOTION SYSTEMS

Induction hardened and ground linear shafts

Induction hardened and hard chrome plated linear shafts

Induction hardened and ground stainless steel linear shafts

Deep case hardened and ground shafts for ball screws

Induction hardened and ground hollow linear shafts

Induction hardened and hard chrome plated hollow linear shafts

Customized precision shafts

NIMET Romania is a major European producer of linear shafts, customized precision shafts and hard chrome plated steel bars and tubes, nickel and chrome plated bars and tubes on the market of linear motion systems and hydraulic equipments.

Nimet is proud of offering a well-conceived range of products manufactured in modern facilities with advanced technologies.

NIMET was established in 2008 and has grown since into a reputable name for the worldwide manufacturers located in more than 70 countries from several industries:

- ✓ *Linear motion equipment industry*
- ✓ *Automotive manufacturing industry*
- ✓ *Body building equipment*
- ✓ *Pharmaceutical industry*
- ✓ *Food processing industry*
- ✓ *Printing machinery*
- ✓ *Lifting, cranes and tail-lift equipment*
- ✓ *Marine and off-shore industry*
- ✓ *Mining industry*
- ✓ *Construction industry*



NIMET
worldwide

Market approach

Right from the outset NIMET has approached the market with competence and professionalism and developed into a modern and dynamic company promoting technical competence, respect and support for the clients.

Located in a green and healthy environment in Lazuri, Dambovită, only 80 km far from Bucharest and about 300 km far from the main Romanian port Constanta, NIMET's strategic geographical position at the crossroads of Asia - Africa - Europe, offers extended feeder services all over the world.

Development

Nimet has realized its growth strategy through production investments and capabilities sustained by researches focused on technologies meant to obtain a better performance of the products in this industrial field. Nimet is prepared to respond to new challenges and has taken part on major worldwide projects along with the biggest players in the industry.

Quality

Working only with the best European mills, considered the most agreed producers in the world of steel, the raw material is supplied in 100% ultra-sonic and anti mixture testing condition.

The main manufacturing processes are controlled by automated measurement systems, active measurement laser systems and CNC machines. Following strict procedures of quality assurance, quality testing is done in Nimet's modern laboratories, successfully contributing in creating quality products and bringing the company in the scheme of a good international repute.

The harmonized process follows the major system management standards: ISO 9001:2008, ISO 14001:2004 and ISO 18001:2007.



The continuous commitment on providing top products, coupled with a reputation for quality service determines our customers to rely on products that serve their increasing needs of quality and Nimet is looking forward to a sustainable development over the next years.



Roundness with uniform distribution of bearing loads ensuring longer service life.



Control of surface hardness, Vickers micro hardness, metallography and structural characteristics of the hardened layer, measurements of chrome layer (thickness, number of micro cracks, chrome micro hardness) in own laboratory.



Exceptional straightness and high quality surface finish as valuable assets in linear motion systems.



Cylindricity, diameter's precision and uniform distribution of the bearing load in the benefit of the shaft's ability to withstand the stress loading.

Linear Shafts and
Customized Precision Shafts
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product overview

Series	Description
NI-W	Induction hardened and ground linear shafts steel grade: Cf53, C55E, C45E / Ø4 - 100 mm / Ø1/4" - 4"
NI-WV	Induction hardened and hard chrome plated linear shafts steel grade: Cf53, C55E, C45E / Ø4 - 100 mm / Ø1/4" - 4"
NI-WRB	Induction hardened and ground stainless steel linear shafts steel grade: X46Cr13 (W1.4034) / Ø5 - 50 mm / Ø1/4" - 2"
NI-WRA	Induction hardened and ground stainless steel linear shafts steel grade: X90CrMoV18 (W1.4112) / Ø5 - 50 mm / Ø1/4" - 2"
NI-WRC	Induction hardened and ground stainless steel linear shafts steel grade: X105CrMo17 (W1.4125) / Ø5 - 50 mm / Ø1/4" - 2"
NI-WP	Deep case hardened and ground shafts for ball screws steel grade: Cf53, C55E, 42CrMo4, 50CrMo4 / Ø20 - 100 mm / Ø3/4" - 4"
NI-WH	Induction hardened and ground hollow linear shafts steel grade: C60E / OD: Ø16 - 50 mm / Ø5/8" - 2"
NI-WHV	Induction hardened and hard chrome plated hollow linear shafts steel grade: C60E / OD: Ø16 - 50 mm / Ø5/8" - 2"
NI-MS	Customized precision shafts

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
C45E	1.1191	Ck45	080M46	C45	S45C	45	1045
X46Cr13	1.4034	X46Cr13	(420S45)	X40Cr14	-	40Ch13	-
X90CrMoV18	1.4112	X90CrMoV18	-	-	-	-	440B
X105CrMo17	1.4125	X105CrMo17	-	-	SUS440C	(95Ch18)	440C
42CrMo4	1.7725	42CrMo4	708M40	42CrMo4	SCM440(H)	35KHM	4140
50CrMo4	1.7228	50CrMo4	708M50	-	SCM445(H)	-	4150, 4147
C60E	1.1221	Ck60	060A62, 070M60	C60	S58C	60, 60G, 60GA	1064

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. 0.40	max. 0.40	max. 0.1	-
C45E	EN 10083-2	0.42 ÷ 0.50	max. 0.4	0.50 ÷ 0.80	max. 0.030	max. 0.035	max. 0.40	max. 0.40	max. 0.1	-
X46Cr13	EN 10088-3	0.43 ÷ 0.50	max. 1.0	max. 1.0	max. 0.040	max. 0.030	12.5 ÷ 14.5	-	-	-
X90CrMoV18	EN 10088-3	0.85 ÷ 0.95	max. 1.0	max. 1.0	max. 0.040	max. 0.030	17.0 ÷ 19.0	-	0.9 ÷ 1.3	0.07 ÷ 0.12
X105CrMo17	EN 10088-3	0.95 ÷ 1.2	max. 1.0	max. 1.0	max. 0.040	max. 0.03	16.0 ÷ 18.0	-	0.4 ÷ 0.8	-
42CrMo4	EN 10083-3	0.38 ÷ 0.45	max. 0.4	0.60 ÷ 0.90	max. 0.025	max. 0.035	0.9 ÷ 1.2	-	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	0.9 ÷ 1.2	-	0.15 ÷ 0.30	-
C60E	EN 10083-2	0.57 ÷ 0.65	max. 0.4	0.60 ÷ 0.90	max. 0.030	max. 0.035	max. 0.40	max. 0.40	max. 0.1	-

Hardenability

Steel grade	Surface hardness HRC min.
Cf53	60
C55E	60
C45E	55
X46Cr13+A	53
X90CrMoV18+A	55
X105CrMo17+A	55
42CrMo4+QT	60
50CrMo4+QT	60
C60E	60

A = annealed
QT = quenched and tempered

✓ 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 minimum guaranteed value of the surface hardness and is established in accordance with ISO 13012, depending on shaft's size.

✓ The minimum guaranteed value of the surface hardness varies by the steel grade.

Mechanical properties for steel bars - NI-W / NI-WV / NI-WRB / NI-WRA / NI-WRC / NI-WP

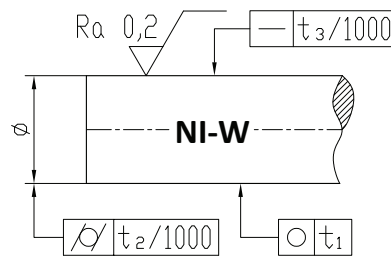
Steel grade	Diameter $\varnothing$ mm	Tensile strength R_m N/mm ²	Yield strength $R_{p0.2}$ N/mm ²	Elongation A_5 %	Hardness Brinell HB
C45E+N	$\varnothing \leq 16$	min. 620	min. 340	min. 14	min. 190
	$16 < \varnothing \leq 100$	min. 580	min. 305	min. 16	min. 172
Cf53+N	$\varnothing \leq 16$	610 - 760	min. 340	min. 16	min. 183
	$16 < \varnothing \leq 100$	610 - 760	min. 340	min. 16	-
C55E+N	$\varnothing \leq 16$	min. 680	min. 370	min. 11	min. 208
	$16 < \varnothing \leq 100$	min. 640	min. 330	min. 12	min. 198
C60E+N	$\varnothing \leq 16$	min. 710	min. 380	min. 10	min. 218
	$16 < \varnothing \leq 100$	min. 670	min. 340	min. 11	min. 203
X46Cr13+A	$5 < \varnothing \leq 50$	max. 800	-	-	max. 245
X90CrMoV18+A	$5 < \varnothing \leq 50$	min. 738	min. 427	min. 9	max. 285
X105CrMo17+A	$5 < \varnothing \leq 50$	min. 758	min. 448	min. 7	max. 285
42CrMo4+QT	$\varnothing \leq 16$	1100 - 1300	min. 900	min. 10	331 - 380
	$16 < \varnothing \leq 100$	900 - 1200	min. 650	min. 12	271 - 359
50CrMo4+QT	$\varnothing \leq 16$	1100 - 1300	min. 900	min. 9	331 - 380
	$16 < \varnothing \leq 100$	900 - 1200	min. 700	min. 12	271 - 359

N=normalized, QT=quenched and tempered, A=annealed

Mechanical properties for hollow shafts - NI-WH / NI-WHV

Steel grade	Yield strength $R_{p0.2}$ N/mm ²	Tensile strength R_m N/mm ²	Elongation A_5 %
C60+NBK	min. 390	720 - 900	min. 14

NBK = normalized in a protective atmosphere.



Shaft Diameter $\varnothing$	Weight	Series	Standard length	Hardening depth SHD min. mm	Roundness (circularity) t1 max. μm	Parallelism (cylindricity) t2 max. μm	Straightness t3 max. mm/m	Standard tolerance ISO h6 μm
mm	kg/m		mm					
4	0.10	NI-W 4	4000	0.4	4	6	0.30	0 / -8
5	0.15	NI-W 5	4000	0.4	4	6	0.25	0 / -8
6	0.22	NI-W 6	6000	0.4	4	6	0.25	0 / -8
8	0.39	NI-W 8	6000	0.4	4	6	0.20	0 / -9
10	0.62	NI-W 10	6000	0.4	4	6	0.20	0 / -9
12	0.89	NI-W 12	6000	0.6	5	8	0.20	0 / -11
14	1.21	NI-W 14	6000	0.6	5	8	0.20	0 / -11
15	1.39	NI-W 15	6000	0.6	5	8	0.20	0 / -11
16	1.58	NI-W 16	6000	0.6	5	8	0.20	0 / -11
20	2.46	NI-W 20	6000	0.9	6	9	0.20	0 / -13
25	3.85	NI-W 25	6000	0.9	6	9	0.15	0 / -13
30	5.55	NI-W 30	6000	0.9	6	9	0.15	0 / -13
35	7.55	NI-W 35	6000	1.5	7	11	0.15	0 / -16
40	9.86	NI-W 40	6000	1.5	7	11	0.15	0 / -16
45	12.48	NI-W 45	6000	1.5	7	11	0.15	0 / -16
50	15.41	NI-W 50	6000	1.5	7	11	0.15	0 / -16
60	22.20	NI-W 60	6000	2.2	8	13	0.15	0 / -19
70	30.20	NI-W 70	6000	2.2	8	13	0.15	0 / -19
80	39.44	NI-W 80	6000	2.2	8	13	0.15	0 / -19
90	49.92	NI-W 90	6000	3.2	10	15	0.15	0 / -22
100	61.62	NI-W 100	6000	3.2	10	15	0.15	0 / -22

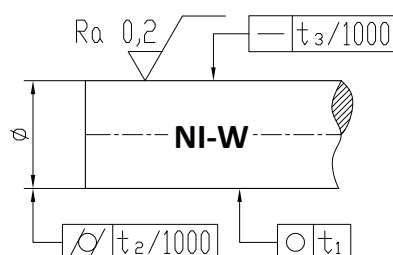
- ✓ Surface hardness: 62±2 HRC
- ✓ Surface roughness: Ra: max. 0.20 μm
- ✓ Length tolerance: ±200 mm
- ✓ Steel grades: Cf53, C55E, alternative C45E, C60E
- ✓ Hardening depth, SHD: according to EN ISO 15787
- ✓ On request: special lengths, tolerances and dimensions

- ✓ Approximately 75 mm of both shaft ends are not guaranteed to be either in diameter tolerance or in the standard hardness values.

Induction Hardened and Ground Linear Shafts

steel grade: Cf53, C55E

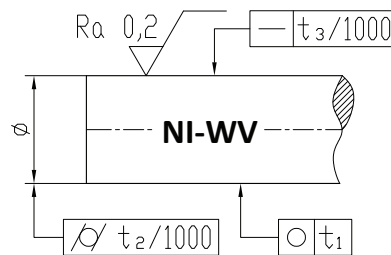
NI-W
imperial sizes



Shaft Diameter $\varnothing$		Weight	Series	Standard length	Hardening depth SHD	Roundness (circularity) t1	Parallelism (cylindricity) t2	Straightness t3	Standard tolerance Class "L"
mm	inch	kg/m		inch	min. inch	max. inch	max. inch	max. in/ft	inch
6.35	1/4	0.25	NI-W 6.35	236.22	0.016	0.00016	0.00023	0.00308	-0.0005 / -0.001
9.525	3/8	0.56	NI-W 9.525	236.22	0.016	0.00016	0.00023	0.00246	-0.0005 / -0.001
12.7	1/2	0.99	NI-W 12.7	236.22	0.024	0.00020	0.00031	0.00246	-0.0005 / -0.001
15.875	5/8	1.55	NI-W 15.875	236.22	0.024	0.00020	0.00031	0.00246	-0.0005 / -0.001
19.05	3/4	2.24	NI-W 19.05	236.22	0.035	0.00024	0.00035	0.00246	-0.0005 / -0.001
22.225	7/8	3.04	NI-W 22.225	236.22	0.035	0.00024	0.00035	0.00185	-0.0005 / -0.001
25.4	1	3.98	NI-W 25.4	236.22	0.035	0.00024	0.00035	0.00185	-0.0005 / -0.001
28.575	1 1/8	5.03	NI-W 28.575	236.22	0.035	0.00024	0.00035	0.00185	-0.0005 / -0.001
31.75	1 1/4	6.21	NI-W 31.75	236.22	0.059	0.00028	0.00043	0.00185	-0.0005 / -0.001
34.925	1 3/8	7.52	NI-W 34.925	236.22	0.059	0.00028	0.00043	0.00185	-0.0005 / -0.001
38.1	1 1/2	8.94	NI-W 38.1	236.22	0.059	0.00028	0.00043	0.00185	-0.0006 / -0.0011
44.45	1 3/4	12.17	NI-W 44.45	236.22	0.059	0.00028	0.00043	0.00185	-0.0006 / -0.0011
50.8	2	15.90	NI-W 50.8	236.22	0.059	0.00028	0.00043	0.00185	-0.0006 / -0.0013
57.15	2 1/4	20.13	NI-W 57.15	236.22	0.087	0.00031	0.00051	0.00185	-0.0007 / -0.0015
63.5	2 1/2	24.85	NI-W 63.5	236.22	0.087	0.00031	0.00051	0.00185	-0.0007 / -0.0015
76.2	3	35.78	NI-W 76.2	236.22	0.087	0.00031	0.00051	0.00185	-0.0008 / -0.0017
88.9	3 1/2	48.70	NI-W 88.9	236.22	0.126	0.00039	0.00059	0.00185	-0.0010 / -0.0020
101.6	4	63.61	NI-W 101.6	236.22	0.126	0.00039	0.00059	0.00185	-0.0012 / -0.0024

- ✓ Surface hardness: 62±2 HRC
- ✓ Surface roughness: Ra: max. 0.20 µm
- ✓ Length tolerance: ±200 mm
- ✓ Steel grades: Cf53, C55E, alternative C45E, C60E
- ✓ Hardening depth, SHD: according to EN ISO 15787
- ✓ On request: special lengths, tolerances and dimensions

- ✓ Approximately 75 mm of both shaft ends are not guaranteed to be either in diameter tolerance or in the standard hardness values.



Shaft Diameter $\varnothing$	Weight	Series	Standard length	Hardening depth SHD min. mm	Roundness (circularity) t1 max. μm	Parallelism (cylindricity) t2 max. μm	Straightness t3 max. mm/m	Standard tolerance ISO h7 μm
mm	kg/m		mm					
4	0.10	NI-WV 4	4000	0.4	5	10	0.30	0 / -12
5	0.15	NI-WV 5	4000	0.4	5	10	0.25	0 / -12
6	0.22	NI-WV 6	6000	0.4	5	10	0.25	0 / -12
8	0.39	NI-WV 8	6000	0.4	6	10	0.20	0 / -15
10	0.62	NI-WV 10	6000	0.4	6	10	0.20	0 / -15
12	0.89	NI-WV 12	6000	0.6	8	12	0.20	0 / -18
14	1.21	NI-WV 14	6000	0.6	8	12	0.20	0 / -18
15	1.39	NI-WV 15	6000	0.6	8	12	0.20	0 / -18
16	1.58	NI-WV 16	6000	0.6	8	12	0.20	0 / -18
20	2.46	NI-WV 20	6000	0.9	9	12	0.20	0 / -21
25	3.85	NI-WV 25	6000	0.9	9	12	0.15	0 / -21
30	5.55	NI-WV 30	6000	0.9	9	12	0.15	0 / -21
35	7.55	NI-WV 35	6000	1.5	11	15	0.15	0 / -25
40	9.86	NI-WV 40	6000	1.5	11	15	0.15	0 / -25
45	12.48	NI-WV 45	6000	1.5	11	15	0.15	0 / -25
50	15.41	NI-WV 50	6000	1.5	11	15	0.15	0 / -25
60	22.20	NI-WV 60	6000	2.2	13	15	0.15	0 / -30
70	30.20	NI-WV 70	6000	2.2	13	15	0.15	0 / -30
80	39.44	NI-WV 80	6000	2.2	13	15	0.15	0 / -30
90	49.92	NI-WV 90	6000	3.2	15	18	0.15	0 / -35
100	61.62	NI-WV 100	6000	3.2	15	18	0.15	0 / -35

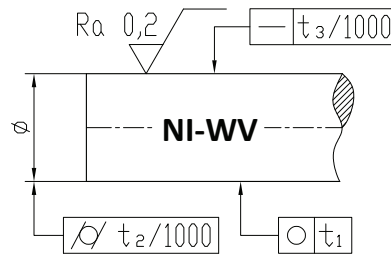
- ✓ Surface hardness: 62±2 HRC
- ✓ Chrome layer thickness: 12±5 μm
- ✓ Chrome layer microhardness: 900-1100HV0.1
- ✓ Surface roughness: Ra: max. 0.20 μm
- ✓ Length tolerance: ±200 mm
- ✓ Steel grades: Cf53, C55E, alternative C45E, C60E
- ✓ Hardening depth, SHD: according to EN ISO 15787
- ✓ On request: special lengths, tolerances and dimensions

- ✓ Approximately 75 mm of both shaft ends are not guaranteed to be either in diameter tolerance or in the standard hardness values.

Induction Hardened and Hard Chrome Plated Linear Shafts

steel grade: Cf53, C55E

NI-WV
imperial sizes



Shaft Diameter $\varnothing$		Weight	Series	Standard length	Hardening depth SHD	Roundness (circularity) t1	Parallelism (cylindricity) t2	Straightness t3	Standard tolerance Class "L"
mm	inch	kg/m		inch	min. inch	max. inch	max. inch	max. in/ft	inch
6.35	1/4	0.25	NI-WV 6.35	236.22	0.016	0.00020	0.00039	0.00308	-0.0005 / -0.001
9.525	3/8	0.56	NI-WV 9.525	236.22	0.016	0.00024	0.00039	0.00246	-0.0005 / -0.001
12.7	1/2	0.99	NI-WV 12.7	236.22	0.024	0.00031	0.00047	0.00246	-0.0005 / -0.001
15.875	5/8	1.55	NI-WV 15.875	236.22	0.024	0.00031	0.00047	0.00246	-0.0005 / -0.001
19.05	3/4	2.24	NI-WV 19.05	236.22	0.035	0.00035	0.00047	0.00246	-0.0005 / -0.001
22.225	7/8	3.04	NI-WV 22.225	236.22	0.035	0.00035	0.00047	0.00185	-0.0005 / -0.001
25.4	1	3.98	NI-WV 25.4	236.22	0.035	0.00035	0.00047	0.00185	-0.0005 / -0.001
28.575	1 1/8	5.03	NI-WV 28.575	236.22	0.035	0.00035	0.00047	0.00185	-0.0005 / -0.001
31.75	1 1/4	6.21	NI-WV 31.75	236.22	0.059	0.00043	0.00059	0.00185	-0.0005 / -0.001
34.925	1 3/8	7.52	NI-WV 34.925	236.22	0.059	0.00043	0.00059	0.00185	-0.0005 / -0.001
38.1	1 1/2	8.94	NI-WV 38.1	236.22	0.059	0.00043	0.00059	0.00185	-0.0006 / -0.0011
44.45	1 3/4	12.17	NI-WV 44.45	236.22	0.059	0.00043	0.00059	0.00185	-0.0006 / -0.0011
50.8	2	15.90	NI-WV 50.8	236.22	0.059	0.00043	0.00059	0.00185	-0.0006 / -0.0013
57.15	2 1/4	20.13	NI-WV 57.15	236.22	0.087	0.00051	0.00059	0.00185	-0.0007 / -0.0015
63.5	2 1/2	24.85	NI-WV 63.5	236.22	0.087	0.00051	0.00059	0.00185	-0.0007 / -0.0015
76.2	3	35.78	NI-WV 76.2	236.22	0.087	0.00051	0.00059	0.00185	-0.0008 / -0.0017
88.9	3 1/2	48.70	NI-WV 88.9	236.22	0.126	0.00059	0.00070	0.00185	-0.0010 / -0.0020
101.6	4	63.61	NI-WV 101.6	236.22	0.126	0.00059	0.00070	0.00185	-0.0012 / -0.0024

- ✓ Surface hardness: 62±2 HRC
- ✓ Chrome layer thickness: 12±5 µm
- ✓ Chrome layer microhardness: 900-1100HV0.1
- ✓ Surface roughness: Ra: max. 0.20 µm
- ✓ Length tolerance: ±200 mm
- ✓ Steel grades: Cf53, C55E, alternative C45E, C60E
- ✓ Hardening depth, SHD: according to EN ISO 15787
- ✓ On request: special lengths, tolerances and dimensions

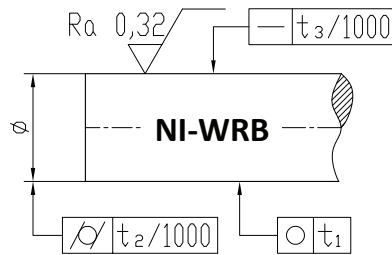
- ✓ Approximately 75 mm of both shaft ends are not guaranteed to be either in diameter tolerance or in the standard hardness values.

NI-WRB

metric sizes
imperial sizes

Induction Hardened and Ground Stainless Steel Linear Shafts

steel grade: X46Cr13 (W1.4034)



Shaft Diameter $\varnothing$	Weight	Series	Standard length	Hardening depth SHD min.	Roundness (circularity) t1 max.	Parallelism (cylindricity) t2 max.	Straightness t3 max.	Standard tolerance ISO h6
mm	kg/m		mm	mm	μm	μm	mm/m	μm
5	0.15	NI-WRB 5	3000	0.4	4	6	0.25	0 / -8
6	0.22	NI-WRB 6	3000	0.4	4	6	0.25	0 / -8
8	0.39	NI-WRB 8	6000	0.4	4	6	0.20	0 / -9
10	0.62	NI-WRB 10	6000	0.4	4	6	0.20	0 / -9
12	0.89	NI-WRB 12	6000	0.6	5	8	0.20	0 / -11
14	1.21	NI-WRB 14	6000	0.6	5	8	0.20	0 / -11
15	1.39	NI-WRB 15	6000	0.6	5	8	0.20	0 / -11
16	1.58	NI-WRB 16	6000	0.6	5	8	0.20	0 / -11
20	2.46	NI-WRB 20	6000	0.9	6	9	0.20	0 / -13
25	3.85	NI-WRB 25	6000	0.9	6	9	0.15	0 / -13
30	5.55	NI-WRB 30	6000	0.9	6	9	0.15	0 / -13
40	9.86	NI-WRB 40	6000	1,5	7	11	0.15	0 / -16
50	15.41	NI-WRB 50	6000	1,5	7	11	0.15	0 / -16

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

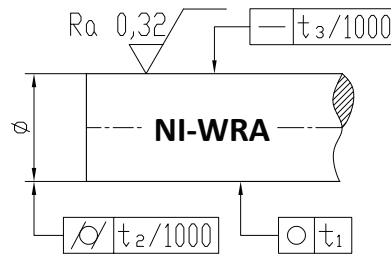
- ✓ Surface hardness: 55±2 HRC
- ✓ Surface roughness: Ra: max. 0.32 μm
- ✓ Length tolerance: ±200 mm
- ✓ Hardening depth, SHD: according to EN ISO 15787
- ✓ On request: special lengths, tolerances and dimensions
- ✓ Additional chrome plating on request

- ✓ Approximately 75 mm of both shaft ends are not guaranteed to be either in diameter tolerance or in the standard hardness values.

Induction Hardened and Ground Stainless Steel Linear Shafts

steel grade: X90CrMoV18 (W1.4112)

NI-WRA
metric sizes
imperial sizes

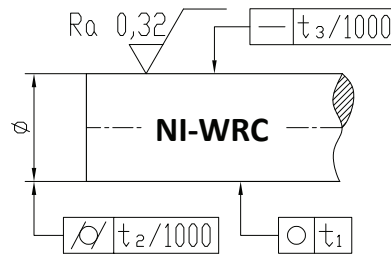


Shaft Diameter Ø	Weight	Series	Standard length	Hardening depth SHD min.	Roundness (circularity) t1 max.	Parallelism (cylindricity) t2 max.	Straightness t3 max.	Standard tolerance ISO h6
mm	kg/m		mm	mm	µm	µm	mm/m	µm
5	0.15	NI-WRA 5	3000	0.4	4	6	0.25	0 / -8
6	0.22	NI-WRA 6	3000	0.4	4	6	0.25	0 / -8
8	0.39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

Shaft Diameter Ø	Weight	Series	Standard length	Hardening depth SHD min.	Roundness (circularity) t1 max.	Parallelism (cylindricity) t2 max.	Straightness t3 max.	Standard tolerance Class "L"
mm inch	kg/m		inch	inch	inch	inch	in/ft	inch
6.35 1/4	0.25	NI-WRA 6.35	118.11	0.016	0.00016	0.00024	0.00308	-0.0005 / -0.001
9.525 3/8	0.56	NI-WRA 9.525	236.22	0.016	0.00016	0.00024	0.00246	-0.0005 / -0.001
12.7 1/2	0.99	NI-WRA 12.7	236.22	0.024	0.00020	0.00031	0.00246	-0.0005 / -0.001
15.875 5/8	1.55	NI-WRA 15.875	236.22	0.024	0.00020	0.00031	0.00246	-0.0005 / -0.001
19.05 3/4	2.24	NI-WRA 19.05	236.22	0.035	0.00024	0.00035	0.00246	-0.0005 / -0.001
25.4 1	3.98	NI-WRA 25.4	236.22	0.035	0.00024	0.00035	0.00185	-0.0005 / -0.001
31.75 1¼	6.21	NI-WRA 31.75	236.22	0.059	0.00028	0.00043	0.00185	-0.0005 / -0.001
38.1 1½	8.94	NI-WRA 38.1	236.22	0.059	0.00028	0.00043	0.00185	-0.0006 / -0.0011
50.8 2	15.90	NI-WRA 50.8	236.22	0.059	0.00028	0.00043	0.00185	-0.0006 / -0.0013

- ✓ Surface hardness: 57±2 HRC
- ✓ Surface roughness: Ra: max. 0.32 µm
- ✓ Length tolerance: ±200 mm
- ✓ Hardening depth, SHD: according to EN ISO 15787
- ✓ On request: special lengths, tolerances and dimensions
- ✓ Additional chrome plating on request

- ✓ Approximately 75 mm of both shaft ends are not guaranteed to be either in diameter tolerance or in the standard hardness values.



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

Shaft Diameter $\varnothing$	Weight	Series	Standard length	Hardening depth SHD min. inch	Roundness (circularity) t1 max. inch	Parallelism (cylindricity) t2 max. inch	Straightness t3 max. in/ft	Standard tolerance Class "L" inch
mm	inch		inch					
6.35	1/4	NI-WRC 6.35	118.11	0.016	0.00016	0.00024	0.00308	-0.0005 / -0.001
9.525	3/8	NI-WRC 9.525	236.22	0.016	0.00016	0.00024	0.00246	-0.0005 / -0.001
12.7	1/2	NI-WRC 12.7	236.22	0.024	0.00020	0.00031	0.00246	-0.0005 / -0.001
15.875	5/8	NI-WRC 15.875	236.22	0.024	0.00020	0.00031	0.00246	-0.0005 / -0.001
19.05	3/4	NI-WRC 19.05	236.22	0.035	0.00024	0.00035	0.00246	-0.0005 / -0.001
25.4	1	NI-WRC 25.4	236.22	0.035	0.00024	0.00035	0.00185	-0.0005 / -0.001
31.75	1 1/4	NI-WRC 31.75	236.22	0.059	0.00028	0.00043	0.00185	-0.0005 / -0.001
38.1	1 1/2	NI-WRC 38.1	236.22	0.059	0.00028	0.00043	0.00185	-0.0006 / -0.0011
50.8	2	NI-WRC 50.8	236.22	0.059	0.00028	0.00043	0.00185	-0.0006 / -0.0013

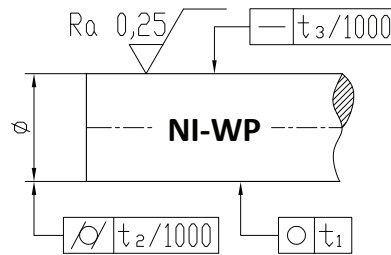
- ✓ Surface hardness: 58±2 HRC
- ✓ Surface roughness: Ra: max. 0.32 μ m
- ✓ Length tolerance: ±200 mm
- ✓ Hardening depth, SHD: according to EN ISO 15787
- ✓ On request: special lengths, tolerances and dimensions
- ✓ Additional chrome plating on request

- ✓ Approximately 75 mm of both shaft ends are not guaranteed to be either in diameter tolerance or in the standard hardness values.

Deep Case Hardened and Ground Shafts for Ball Screw

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

NI-WP
metric sizes
imperial sizes

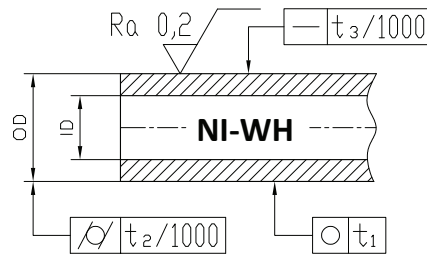


Shaft Diameter Ø	Weight	Series	Standard length	Hardening depth SHD min.	Roundness (circularity) t1 max.	Parallelism (cylindricity) t2 max.	Straightness t3 max.	Standard tolerance ISO h6
mm	kg/m		mm	mm	µm	µm	mm/m	µm
20	2.46	NI-WP 20	6000	4.0	6	9	0.3	0 / -13
25	3.85	NI-WP 25	6000	4.0	6	9	0.3	0 / -13
30	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 Ø	Weight	Series	Standard length	Hardening depth SHD min.	Roundness (circularity) t1 max.	Parallelism (cylindricity) t2 max.	Straightness t3 max.	Standard tolerance 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 1⅝	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: 62±2 HRC
- ✓ Surface roughness: Ra: max. 0.25 µm
- ✓ Length tolerance: ±200 mm
- ✓ Roundness: max. ½ from the tolerance's interval of diameter measured as radial deviation
- ✓ Steel grades condition: Cf53, C55E, 42CrM4+QT, 50CrMo4+QT
- ✓ Hardening depth, SHD: according to EN ISO 15787
- ✓ On request: special lengths, tolerances and dimensions

- ✓ Approximately 75 mm of both shaft ends are not guaranteed to be either in diameter tolerance or in the standard hardness values.



Outside Diameter OD	Inside Diameter ID	Weight	Series	Standard length	Hardening depth SHD	Roundness (circularity) t1	Parallelism (cylindricity) t2	Straightness t3	Standard tolerance ISO h6
mm	mm	kg/m		mm	min. mm	max. μm	max. μm	max. mm/m	μm
16	7	1.28	NI-WH 16x7	6000	0.6	5	8	0.20	0 / -11
20	14	1.25	NI-WH 20x14	6000	0.9	6	9	0.20	0 / -13
25	15	2.47	NI-WH 25x15	6000	0.9	6	9	0.15	0 / -13
30	18	3.55	NI-WH 30x18	6000	0.9	6	9	0.15	0 / -13
40	28	5.03	NI-WH 40x28	6000	1.2	7	11	0.15	0 / -16
40	26	5.70	NI-WH 40x26	6000	1.2	7	11	0.15	0 / -16
50	30	9.87	NI-WH 50x30	6000	1.5	7	11	0.15	0 / -16

Outside Diameter OD		Inside Diameter ID		Weight	Series	Standard length	Hardening depth SHD	Roundness (circularity) t1	Parallelism (cylindricity) t2	Straightness t3	Standard tolerance Class "L"
mm	inch	mm	inch	kg/m		inch	min. inch	max. inch	max. inch	max. in/ft	inch
15.875	5/8	6.35	0.25	1.30	NI-WH 15.875x6.35	236.22	0.0236	0.000197	0.000315	0.00246	-0.0005 / -0.001
19.05	3/4	11.125	0.438	1.48	NI-WH 19.05x11.125	236.22	0.0354	0.000236	0.000354	0.00246	-0.0005 / -0.001
25.4	1	15.494	0.61	2.50	NI-WH 25.4x15.494	236.22	0.0354	0.000236	0.000354	0.00185	-0.0005 / -0.001
31.75	1¼	18.288	0.72	4.15	NI-WH 31.75x18.288	236.22	0.0354	0.000236	0.000354	0.00185	-0.0005 / -0.001
38.1	1½	22.606	0.89	5.80	NI-WH 38.1x22.606	236.22	0.0472	0.000276	0.000433	0.00185	-0.0006 / -0.0011
50.8	2	31.75	1.25	9.69	NI-WH 50.8x31.75	236.22	0.0591	0.000276	0.000433	0.00185	-0.0006 / -0.0013

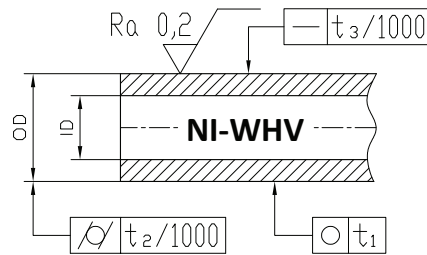
- ✓ Surface hardness: 62±2 HRC
- ✓ Surface roughness: Ra: max. 0.20 μm
- ✓ Length tolerance: ±200 mm
- ✓ Hardening depth, SHD: according to EN ISO 15787
- ✓ On request: special lengths, tolerances and dimensions

- ✓ Approximately 75 mm of both shaft ends are not guaranteed to be either in diameter tolerance or in the standard hardness values.

Induction Hardened and Hard Chrome Plated Hollow Linear Shafts

steel grade: C60E (alternative C55E)

NI-WHV
metric sizes
imperial sizes



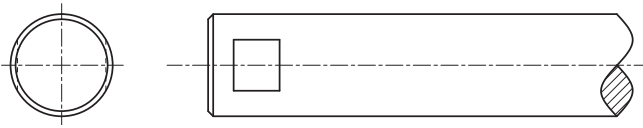
Outside Diameter OD	Inside Diameter ID	Weight	Series	Standard length	Hardening depth SHD	Roundness (circularity) t1	Parallelism (cylindricity) t2	Straightness t3	Standard tolerance ISO h7
mm	mm	kg/m		mm	min. mm	max. μm	max. μm	max. mm/m	μm
16	7	1.28	NI-WHV 16x7	6000	0.6	8	12	0.20	0 / -18
20	14	1.25	NI-WHV 20x14	6000	0.9	9	12	0.20	0 / -21
25	15	2.47	NI-WHV 25x15	6000	0.9	9	12	0.15	0 / -21
30	18	3.55	NI-WHV 30x18	6000	0.9	9	12	0.15	0 / -21
40	28	5.03	NI-WHV 40x28	6000	1.2	11	15	0.15	0 / -25
40	26	5.70	NI-WHV 40x26	6000	1.2	11	15	0.15	0 / -25
50	30	9.87	NI-WHV 50x30	6000	1.5	11	15	0.15	0 / -25

Outside Diameter OD		Inside Diameter ID		Weight	Series	Standard length	Hardening depth SHD	Roundness (circularity) t1	Parallelism (cylindricity) t2	Straightness t3	Standard tolerance Class "L"
mm	inch	mm	inch	kg/m		inch	min. inch	max. inch	max. inch	max. in/ft	inch
15.875	5/8	6.35	0.25	1.30	NI-WHV 15.875x6.35	236.22	0.0236	0.000315	0.000472	0.00246	-0.0005 / -0.001
19.05	3/4	11.125	0.438	1.48	NI-WHV 19.05x11.125	236.22	0.0354	0.000354	0.000472	0.00246	-0.0005 / -0.001
25.4	1	15.494	0.61	2.50	NI-WHV25.4x15.494	236.22	0.0354	0.000354	0.000472	0.00185	-0.0005 / -0.001
31.75	1¼	18.288	0.72	4.15	NI-WHV 31.75x18.288	236.22	0.0354	0.000354	0.000472	0.00185	-0.0005 / -0.001
38.1	1½	22.606	0.89	5.80	NI-WHV 38.1x22.606	236.22	0.0472	0.000433	0.000591	0.00185	-0.0006 / -0.0011
50.8	2	31.75	1.25	9.69	NI-WHV 50.8x31.75	236.22	0.0591	0.000433	0.000591	0.00185	-0.0006 / -0.0013

- ✓ Surface hardness: 62±2 HRC
- ✓ Surface roughness: Ra: max. 0.20 μm
- ✓ Chrome thickness: 12±5 μm
- ✓ Chrome layer microhardness: 900 - 1100 HV0.1
- ✓ Length tolerance: ±200 mm
- ✓ Hardening depth, SHD: according to EN ISO 15787
- ✓ On request: special lengths, tolerances and dimensions

- ✓ Approximately 75 mm of both shaft ends are not guaranteed to be either in diameter tolerance or in the standard hardness values.

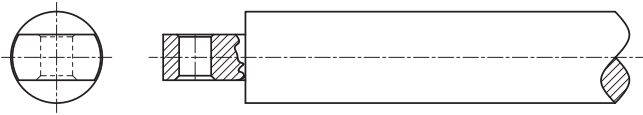
Crosswise groove



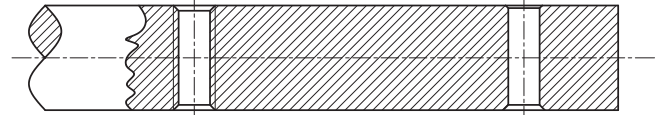
Outside diameter thread



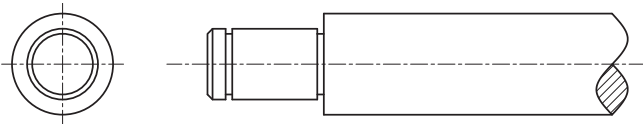
End for mount with clevis clamp



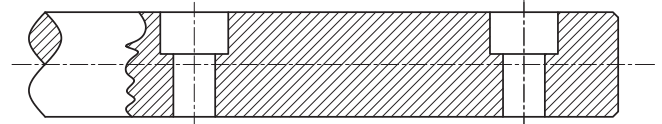
Tapped or drilled holes radially through shaft



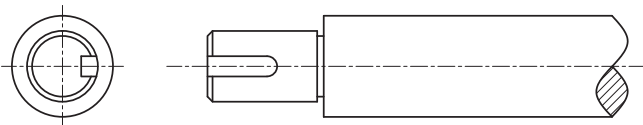
Grooves for snap ring



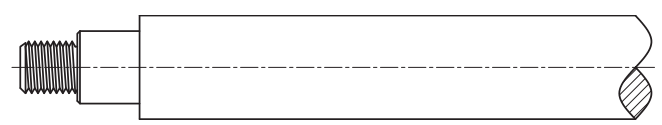
Radial drilling holes, bored



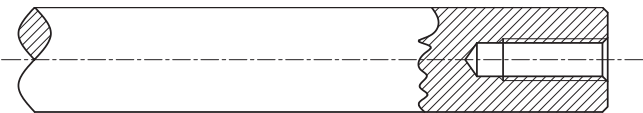
Reduced diameter with/without feather keyway



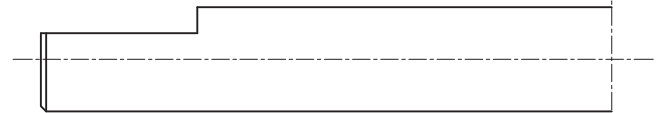
Reduced diameter with threaded end



Axial drilled and threaded to ends



D-cut shape



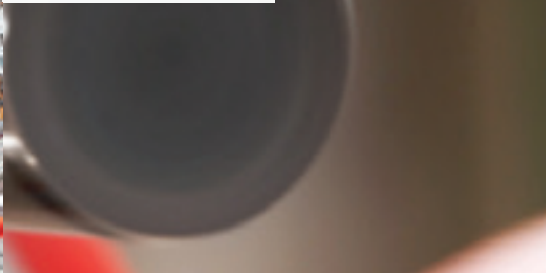
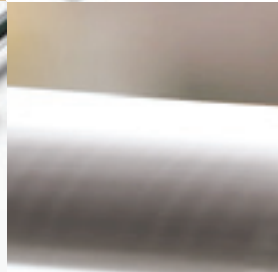
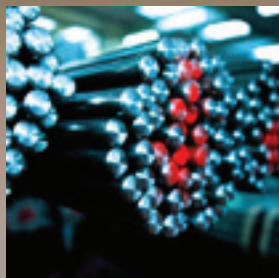
✓ On request: we can provide other types of shaft machining and customized solutions



Our company has established a clearly defined production program, following a number of steps according to the products specification and customers requirements.

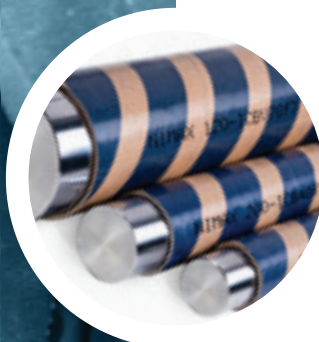
- | | |
|-----------------------------|-------------------|
| ✓ Design | ✓ Polishing |
| ✓ Peeling and straightening | ✓ Machining |
| ✓ Grinding | ✓ Quality control |
| ✓ Induction hardening | ✓ Packing |
| ✓ Hard chrome plating | |







Wooden cases
for induction hardened linear shafts



Cardboard tubes
for induction hardened and hard chrome plated linear shafts



Wooden pallets
for smallest cut lengths or machined shaft



Aluminium foil vacuum bag
for sea transport

Storage and handling recommendations:

- ✓ Keep the products stored in dry and covered spaces.
- ✓ Always use gloves when handling the shafts.
- ✓ Do not expose for a long time the bars or tubes to the sunlight or to very low temperatures.
- ✓ For storage, preferable to use rubber supports or wood lined supports; direct contact with the floor and steel supports that aren't lined with soft materials must to be avoided.
- ✓ Whenever possible, please use the cranes to load or unload the bundles; when you use the fork lifts please avoid the direct contact of the forks with the products.
- ✓ Always, lift the bundles using the textile slings. Don't use metal slings during handling of bundles.
- ✓ Keep always dry the cardboard tubes that protect the chromed products.





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