

NIMET

WHERE
INNOVATION
LIVES



WRA

INDUCTION HARDENED AND GROUND STAINLESS STEEL LINEAR SHAFTS

TECHNICAL SHEET

NI-WRA-TS-2020

NI-SERIES



INDUCTION HARDENED AND GROUND STAINLESS STEEL LINEAR SHAFTS

STEEL GRADES CORRESPONDENTS

EN	Werkstoff	DIN	B.S.	UNI	JIS	GOST	AISI / SAE / ASTM
X90CrMoV18	1.4112	X90CrMoV18	-	-	-	-	440B

CHEMICAL COMPOSITION - IN % BY WEIGHT

Steel grade	C	Si	Mn	P	S	Cr	Ni	Mo	V
X90CrMoV18	0.85 ÷ 0.95	max. 1.0	max. 1.0	max. 0.040	max. 0.030	17.0 ÷ 19.0	-	0.90 ÷ 1.30	0.07 ÷ 0.12

MECHANICAL PROPERTIES

Steel grade	Diameter	Tensile strength	Yield strength	Elongation	Hardness	Norm
	Ø mm	R _m N/mm ²	R _{p0.2} N/mm ²	A ₅ %	Brinell HB	
X90CrMoV18+A	4 < Ø ≤ 50	min. 738	min. 427	min. 9	max. 285	EN 10088-3

A=annealed

HARDENABILITY

Steel grade	Surface hardness HRC min.
X90CrMoV18+A	55

A = annealed



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 depending the steel grade.

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Steel grade X90CrMoV18 (W1.4112)

Surface hardness 57±2 HRC

Surface roughness Ra max. 0.32 µm

Length tolerance ±200 mm

Surface hardening depth, SHD according to EN ISO 15787

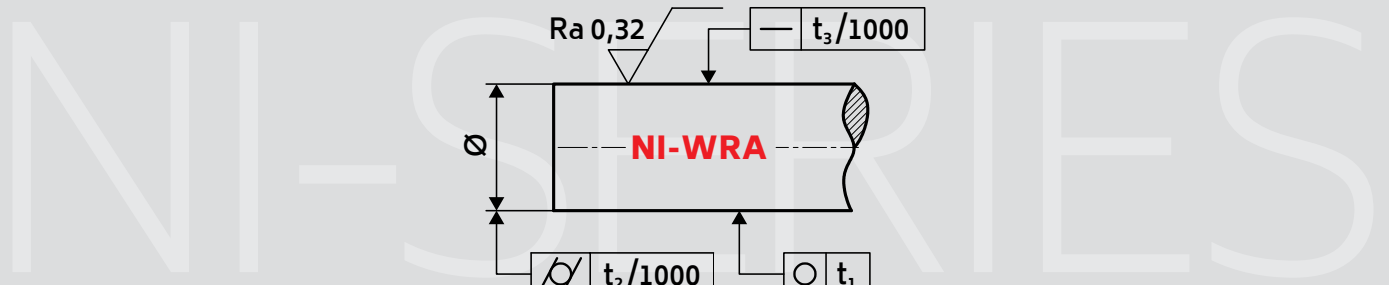
On request special lengths, tolerances and dimensions
chrome plating

NI-WRA/METRIC

Shaft Diameter Ø	Weight	Series	Standard length	Surface hardening depth	Roundness (circularity)	Parallelism (cylindricity)	Straightness	Standard tolerance ISO h6
				SHD (min. + tol.)	t ₁ max.	t ₂ max.	t ₃ max.	
mm	kg/m		mm	mm	µm	µm	mm/m	µm
4	0.10	NI-WRA 4	3000	min. 0.4	4	6	0.25	0/-8
5	0.15	NI-WRA 5	3000	min. 0.4	4	6	0.25	0/-8
6	0.22	NI-WRA 6	3000	0.4+0.9	4	6	0.25	0/-8
8	0.39	NI-WRA 8	6000	0.4+0.9	4	6	0.20	0/-9
10	0.62	NI-WRA 10	6000	0.4+0.9	4	6	0.20	0/-9
12	0.89	NI-WRA 12	6000	0.6+0.9	5	8	0.20	0/-11
14	1.21	NI-WRA 14	6000	0.6+0.9	5	8	0.20	0/-11
15	1.39	NI-WRA 15	6000	0.6+0.9	5	8	0.20	0/-11
16	1.58	NI-WRA 16	6000	0.6+0.9	5	8	0.20	0/-11
20	2.46	NI-WRA 20	6000	0.8+0.8	6	9	0.20	0/-13
25	3.85	NI-WRA 25	6000	0.9+0.8	6	9	0.15	0/-13
30	5.55	NI-WRA 30	6000	0.9+0.8	6	9	0.15	0/-13
35	7.55	NI-WRA 35	6000	1.5+1.3	7	11	0.15	0/-16
40	9.86	NI-WRA 40	6000	1.5+1.3	7	11	0.15	0/-16
50	15.41	NI-WRA 50	6000	1.5+1.3	7	11	0.15	0/-16

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Surface hardness 57±2 HRC

Surface roughness Ra max. 0.32 µm

Length tolerance ±200 mm

Surface hardening depth, SHD according to EN ISO 15787

On request special lengths, tolerances and dimensions
chrome plating

NI-WRA / IMPERIAL

Shaft Diameter Ø		Weight	Series	Standard length	Surface hardening depth SHD (min. + tol.)	Roundness (circularity) t ₁ max.	Parallelism (cylindricity) t ₂ max.	Straightness t ₃ max.	Standard tolerance Class "L" inch
mm	inch	kg/m		inch	inch	inch	inch	in/ft	inch
6.35	0.25	0.25	NI-WRA 6.35	118.11	0.016 + 0.035	0.00016	0.00024	0.00308	-0.0005 / -0.001
9.525	0.375	0.56	NI-WRA 9.525	236.22	0.016 + 0.035	0.00016	0.00024	0.00246	-0.0005 / -0.001
12.7	0.5	0.99	NI-WRA 12.7	236.22	0.024 + 0.035	0.00020	0.00031	0.00246	-0.0005 / -0.001
15.875	0.625	1.55	NI-WRA 15.875	236.22	0.024 + 0.035	0.00020	0.00031	0.00246	-0.0005 / -0.001
19.05	0.75	2.24	NI-WRA 19.05	236.22	0.032 + 0.032	0.00024	0.00035	0.00246	-0.0005 / -0.001
25.4	1	3.98	NI-WRA 25.4	236.22	0.035 + 0.032	0.00024	0.00035	0.00185	-0.0005 / -0.001
31.75	1.25	6.21	NI-WRA 31.75	236.22	0.059 + 0.051	0.00028	0.00043	0.00185	-0.0005 / -0.001
38.1	1.5	8.94	NI-WRA 38.1	236.22	0.059 + 0.051	0.00028	0.00043	0.00185	-0.0006 / -0.0011
50.8	2	15.90	NI-WRA 50.8	236.22	0.087 + 0.063	0.00028	0.00043	0.00185	-0.0006 / -0.0013

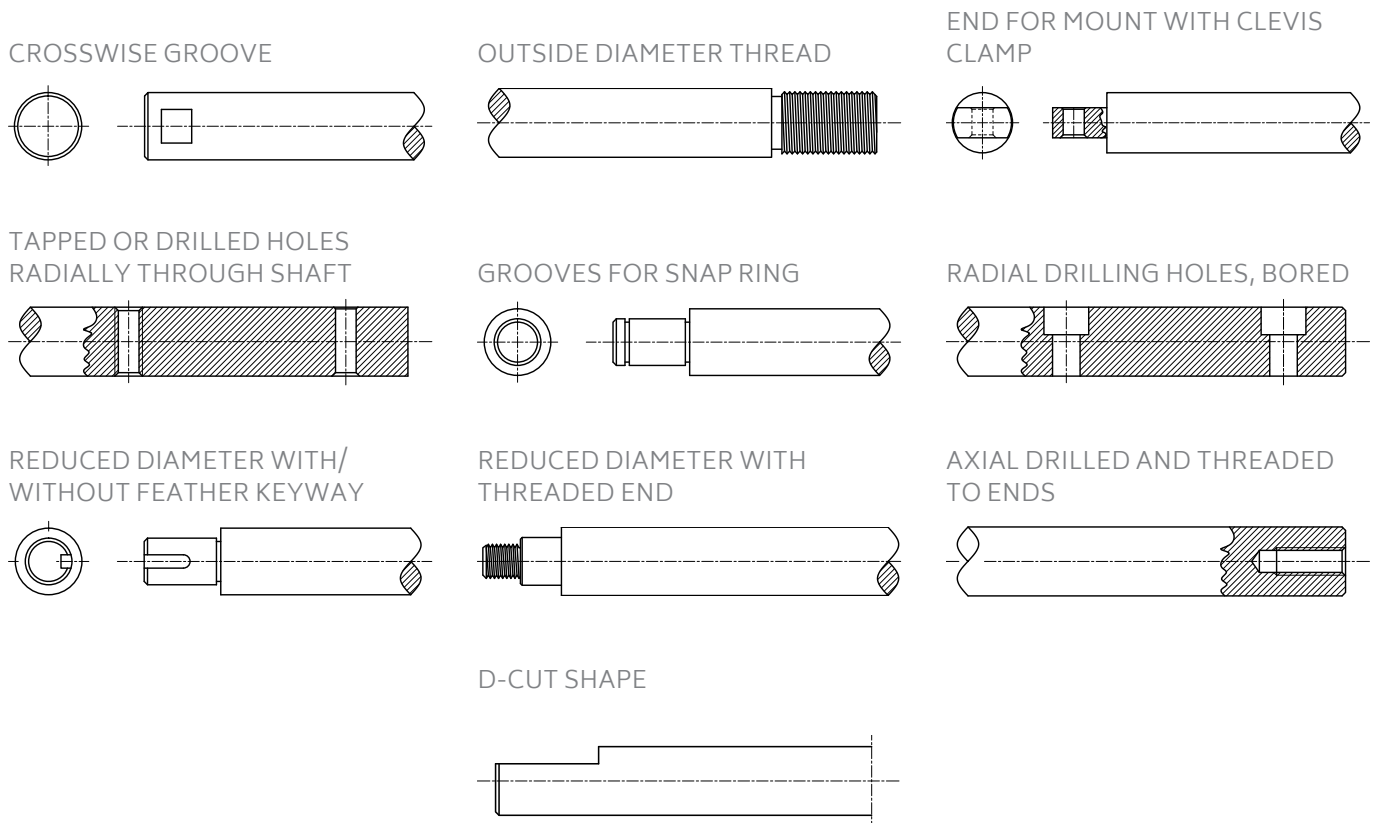
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PACKING SOLUTIONS

- Branorost paper, spacer rings, raffia and wooden boxes for \varnothing 4 - 16 mm.
- Bundles protected with branorost paper, spacer rings and raffia for \varnothing over 16 mm. Same range but in chrome plated condition can be packed in individual cardboard tubes.
- Customized packaging solutions - wooden cases and wooden Euro-pallets.
- Aluminum foil vacuum bags extra protection of bundles for overseas transportation.

STORAGE AND HANDLING RECOMMENDATIONS

- Keep the products stored in dry and covered spaces.
- Whenever possible, please use the crane to load or unload the bundles; when you use the fork lift, please avoid the direct contact of the forks with the products.
- Always lift the bundles using textile slings. Do not use metal slings during handling of bundles.
- Always use gloves when handling the shafts.
- Always keep dry the cardboard tubes that protect the chromed products.



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