



CROMSTEEL

Precision shafts

for linear motion

Machined parts



Precision shafts for linear motion

Precision shafts are induction hardened with frequencies from 3 to over 400 KHz, depending on steel grade, shaft diameter and desired hardness depth.

The induction hardening process hardens the surface layer of the shaft to an optimal degree to counter wear and tear. At the same time, the shaft core remains soft and ensures a good resilience.

Our precision shafts are ground to h6 and h7 tolerances and smoothly polished (super-finished).

This catalogue sums up our experience in working with linear motion precision shafts and our history in supplying a wide range of customers active in different industries and countries.

We have designed it as a handy informative tool for the needs of both purchasing and technical functions, aiming to maximum clarity.

Our customers' trust in the quality and reliability of our precision shafts for linear motion is for us the greatest acknowledgment of our passion and care for the continuous improvement of our processes and quality standards.

Cromsteel has built a fully equipped workshop to provide any kind of machining according to customer's drawing, e.g.:

cutting

axial drilling / tapping

radial drilling / tapping

flat milling

diameter reduction

hardened surface annealing

Catalogue for Precision shafts

Index

	Page
Steel grade equivalents	2
Chemical composition	2
Mechanical properties	3
Tips for reading product sheets	4
Machining examples	5

Code	Product	Page
W	Induction hardened and ground linear shafts	6
WZ	<i>Induction hardened and ground linear shafts, inch size</i>	7
WV	Induction hardened, chrome plated and ground linear shafts	8
WVZ	<i>Induction hardened, chrome plated and ground linear shafts, inch size</i>	9
WRA	Induction hardened and ground linear shafts, stainless steel (X90)	10
WRAZ	<i>Induction hardened and ground linear shafts, stainless steel (X90), inch size</i>	12
WRB	Induction hardened and ground linear shafts, stainless steel (X46)	11
WRBZ	<i>Induction hardened and ground linear shafts, stainless steel (X46), inch size</i>	12
WRBV	Induction hardened, chrome plated and ground linear shafts, stainless steel (X46)	13
WH	Induction hardened and ground linear shafts, hollow	14
WHV	Induction hardened, chrome plated and ground linear shafts, hollow	14
WP	Induction hardened and ground linear shafts for ball screws	15
WPZ	Induction hardened and ground linear shafts for ball screws, inch size	15

General technical specifications

Steel grade equivalents*

Euronorm	DIN	Werkstoff Nr.	AFNOR	BS	UNI	JIS	ASTM
C53 EN 10083-2	Cf53 DIN 17212	1.1213	XC48TS	070MS	C53	—	1050
C60 EN 17200	C60 DIN 17200	1.0601	1C60	60HS	C60	S58C	1060
X46Cr13 EN 10088-3	X46Cr13 DIN 17440	1.4034	Z44Cr13	420S45	X40Cr14	—	420C
X90CrMoV18 EN 10088-3	X90CrMoV18 DIN 10088-3	1.4112	—	—	—	—	440B
50CrMo4 EN 17200	50CrMo4 EN 17200	1.7228	—	708M50	—	—	4150
100Cr6 EN 10027-1	100Cr6 DIN 17230	1.3505	100C6	534A99	100Cr6	SUJ2	52100

*) The above shown equivalents are purely indicative: steel grades manufactured according to different standards may not match

Chemical composition*

Steel grade		C	Si	Mn	P	S	Cr	Ni	Mo	V	N
Cf53	min	0,50	0,15	0,40							
	max	0,57	0,35	0,70	0,025	0,035					
C60	min	0,57		0,60							
	max	0,65	0,40	0,90	0,030	0,035	0,40	0,40	0,10		
X46Cr13	min	0,42					12,0				
	max	0,50	1,0	1,0	0,045	0,030	14,5				
X90CrMoV18	min	0,85					17,0		0,9	0,07	
	max	0,95	1,0	1,0	0,040	0,030	19,0		1,3	0,12	
50CrMo4	min	0,46		0,50			0,90		0,15		
	max	0,54	0,40	0,80	0,025	0,035	1,20		0,30		
100Cr6	min	0,93	0,15	0,25			1,35				
	max	1,05	0,35	0,45	0,025	0,015	1,60		0,10		

*) As % on weight



General technical specifications

Mechanical properties

Product code	Steel grade	Diameter	Tensile strength (Rm)	Yield strength (Rp _{0.2})	Elongation (A5)	Core hardness	Surface hardness
		mm	MPa	MPa	%	HB	HRC
W	Cf53	Ø ≤ 18	610 - 850	min. 475	min. 8	max. 223	62±2
WV		18 < Ø ≤ 100	610 - 760	min. 340	min. 16		
WZ		Ø > 100	min. 560	min. 275	min. 16		
WVZ							
WH	C60	Ø ≤ 16	min. 710	min. 380	min. 10	min. 218 max. 203	62±2
WHV		16 < Ø ≤ 40	min. 670	min. 340	min. 11		
		40 < Ø ≤ 80	min. 670	min. 240	min. 12		
WRA WRAZ	X90CrMoV18	Ø ≤ 60	min. 738	min. 427	min. 9	max. 285	56±3
WRB WRBZ WRBV	X46Cr13	Ø ≤ 60	max. 910	min. 427	min. 9	max. 305	55±3
WP WPZ	50CrMo4	20 ≤ Ø ≤ 120	800 - 1100	min. 600	min. 10		**
WP WPZ	100Cr6	20 ≤ Ø ≤ 120	650 - 880	350 - 550	8 - 25		**



Tips for reading Product sheets

Each product sheet contains all standard parameters for the given product, including the identification colour used for marking the bar end.

Length tolerance for cut parts

The standard tolerance on the length of the cut parts (not machined):

diameters from 6 mm to 30 mm: ± 1 mm
diameters above 30 mm: ± 2 mm

Any request for special length tolerance of cut pieces will be evaluated case by case.

Packaging types

Standard packaging for chrome plated bars and tubes: plastic sleeve on each bar / tube (OD from 14 mm to 120 mm), plastic rings (diameters < 14 mm), cardboard tubes (diameters above 120 mm).

On request:

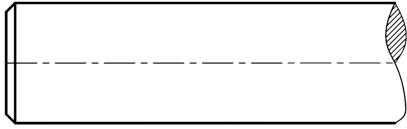
cardboard tubes on each bar / tube (diameter 16 mm and above)
plastic rings
sea freight: seaworthy vacuum aluminium bags
other packaging types: wooden boxes, pallets, pallets with sides and cover etc.

Recommendations for proper storage and handling

- stock the bars / tubes in warehouses with controlled humidity
- avoid direct sunlight
- avoid direct contact with floors
- the bars / tubes must lay on supporting surfaces padded with rubber or wood
- whenever possible, use a crane for loading/unloading operations; if a forklift must be used, be sure to pad any contact surface with wood, plastic or rubber
- upon handling, lift the bundles with plastic or tissue belts (never use metal belts)
- always lift the bars / tubes from two points: lifting them from one point (e.g. in the middle of the length) may damage their straightness and create dangerous situations
- beware the risk of corrosion when stocking the bars / tubes; environments with high pollution or with high salt concentration are very corrosive

Machining examples

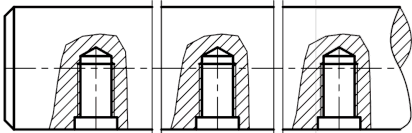
Cutting and deburring



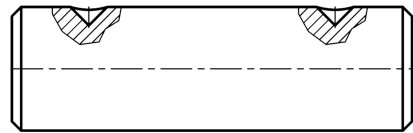
Axial drilling and tapping



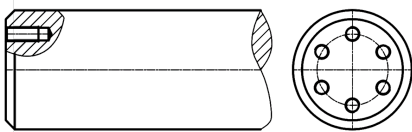
Radial drilling and tapping



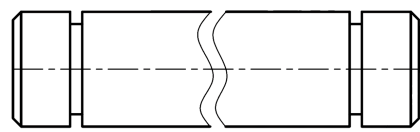
Screw seats



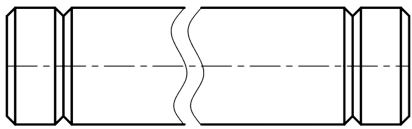
Pitch circle drilling and tapping



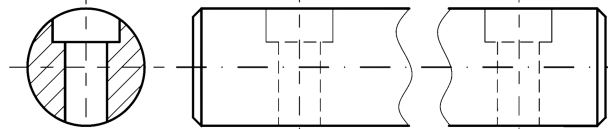
Snap ring grooves



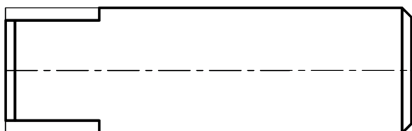
Circumference grooves



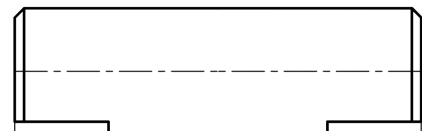
Radial passthrough bores



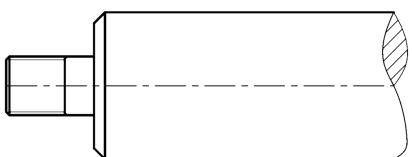
Plain milling for keys



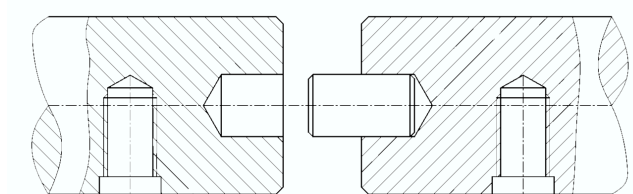
Plain milling



Threaded reduced diameters



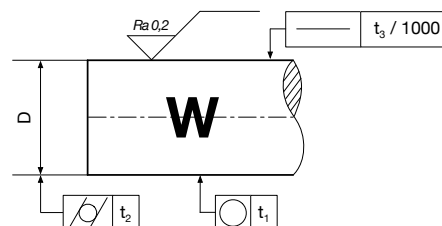
Shaft coupling



Induction hardened and ground linear shafts

Steel grade

Cf53



Diameter	Weight	Product code	Standard length	Hardness depth SHD	Standard tolerance	Roundness	Parallelism	Straightness
D			L	DIN ISO 15787	h6	t ₁	t ₂	t ₃
mm	Kg/m		mm	mm	µm	µm	µm	mm/m
4	0,10	W 4	2000/4000	0,5 - 0,8	0/-8	4	6	0,16
5	0,15	W 5	6000	0,5 - 0,8	0/-8	4	6	0,16
6	0,22	W 6	6000	0,5 - 0,8	0/-8	4	6	0,16
8	0,39	W 8	6000	0,6 - 0,9	0/-9	4	6	0,16
10	0,62	W 10	6000	0,7 - 1,0	0/-9	4	6	0,12
12	0,89	W 12	6000	0,8 - 1,2	0/-11	5	8	0,12
13	1,04	W 13	6000	0,8 - 1,2	0/-11	5	8	0,12
14	1,21	W 14	6000	0,9 - 1,3	0/-11	5	8	0,12
15	1,39	W 15	6000	1,0 - 1,4	0/-11	5	8	0,12
16	1,58	W 16	6000	1,1 - 1,5	0/-11	5	8	0,1
18	2,00	W 18	6000	1,1 - 1,5	0/-11	5	8	0,1
20	2,46	W 20	6000	1,2 - 1,5	0/-13	6	8	0,1
22	2,98	W 22	6000	1,2 - 1,5	0/-13	6	8	0,1
24	3,55	W 24	6000	1,4 - 1,6	0/-13	6	8	0,1
25	3,85	W 25	6000	1,5 - 1,7	0/-13	6	9	0,1
28	4,83	W 28	6000	1,5 - 1,8	0/-13	6	9	0,1
30	5,55	W 30	6000	1,5 - 1,9	0/-13	6	9	0,1
32	6,31	W 32	6000	1,5 - 1,9	0/-16	7	11	0,1
35	7,55	W 35	6000	1,5 - 1,9	0/-16	7	11	0,1
40	9,86	W 40	6000	1,6 - 2,0	0/-16	7	11	0,1
45	12,48	W 45	6000	1,6 - 2,0	0/-16	7	11	0,1
50	15,41	W 50	6000	2,2 - 2,6	0/-16	7	11	0,1
55	18,64	W 55	6000	2,2 - 2,6	0/-19	8	13	0,1
60	22,18	W 60	6000/7000	2,2 - 2,6	0/-19	8	13	0,1
65	26,03	W 65	6000/7000	2,2 - 2,6	0/-19	8	13	0,1
70	30,19	W 70	6000/7000	2,2 - 2,6	0/-19	8	13	0,1
75	34,66	W 75	6000/7000	2,2 - 2,6	0/-19	8	13	0,1
80	39,44	W 80	6000/7000	2,2 - 2,6	0/-19	8	13	0,1
90	49,91	W 90	6000/7000	2,2 - 3,2	0/-22	9	13	0,2
100	61,62	W 100	6000/7000	2,2 - 3,2	0/-22	9	13	0,2
120	88,73	W 120	6000/7000	2,5 - 4,0	0/-22	10	16	0,2

Other specs

Surface hardness

62±2 HRC

Surface roughness

Ra max 0,2 µm

Length tolerance

0/+200 mm

Packaging

Standard: protective oil, bundle

Upon request: wooden box, seaworthy packaging, Branorost, Lamiflex

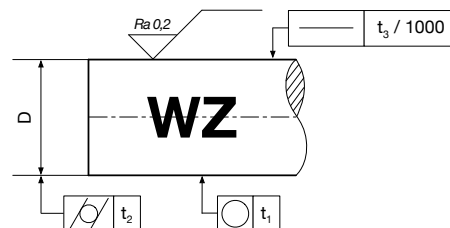
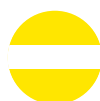


CROMSTEEL

Induction hardened and ground linear shafts, inch size

Steel grade

Cf53



Diam.	Diam.	Weight	Product code	Standard length	Hardness depth SHD	Standard tolerance	Roundness	Parallelism	Straightness
D	D	Kg/m		L	DIN ISO 15787	classe "L"	t ₁	t ₂	t ₃
inch	mm			inch	inch	inch	inch	inch	inch
1/4	6,35	0,25	WZ 6	237	0,019 - 0,031	-0,0005/-0,001	0,0002	0,0002	0,008
3/8	9,525	0,56	WZ 9	237	0,027 - 0,039	-0,0005/-0,001	0,0002	0,0002	0,008
1/2	12,7	0,99	WZ 12	237	0,031 - 0,047	-0,0005/-0,001	0,0002	0,0003	0,008
5/8	15,875	1,55	WZ 15	237	0,043 - 0,059	-0,0005/-0,001	0,0002	0,0003	0,008
3/4	19,05	2,24	WZ 19	237	0,047 - 0,059	-0,0005/-0,001	0,0002	0,0004	0,008
1	25,4	3,98	WZ 25	237	0,059 - 0,066	-0,0005/-0,001	0,0002	0,0004	0,008
1 ¼	31,75	6,21	WZ 31	237	0,059 - 0,074	-0,0005/-0,001	0,0003	0,0004	0,004
1 ½	38,1	8,94	WZ 38	237	0,062 - 0,078	-0,0006/-0,0011	0,0003	0,0004	0,004
2	50,8	15,90	WZ 50	237	0,086 - 0,102	-0,0006/-0,0013	0,0003	0,0004	0,004
2 ¼	57,15	20,13	WZ 57	237	0,086 - 0,102	-0,0007/-0,0015	0,0003	0,0005	0,004
2 ½	63,5	24,85	WZ 63	237 - 276	0,086 - 0,102	-0,0007/-0,0015	0,0003	0,0005	0,004
3	76,2	35,78	WZ 76	237 - 276	0,086 - 0,102	-0,0008/-0,0017	0,0003	0,0005	0,004

Other specs

Surface hardness

62±2 HRC

Surface roughness

Ra max 0,2 µm

Length tolerance

0/+8" (0/+200 mm)

Packaging

Standard: protective oil, bundle

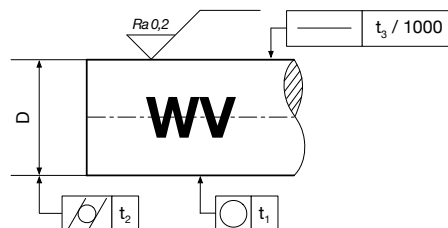
Upon request: wooden box, seaworthy packaging, Branorost, Lamiflex



Induction hardened, chrome plated and ground linear shafts

Steel grade

Cf53



Diameter	Weight	Product code	Standard length	Hardness depth SHD	Standard tolerance	Roundness	Parallelism	Straightness
D			L	DIN ISO 15787	h7	t ₁	t ₂	t ₃
mm	Kg/m		mm	mm	µm	µm	µm	mm/m
4	0,10	WV 4	2000/4000	0,5 - 0,8	0/-12	6	10	0,16
5	0,15	WV 5	6000	0,5 - 0,8	0/-12	6	10	0,16
6	0,22	WV 6	6000	0,5 - 0,8	0/-12	6	10	0,16
8	0,39	WV 8	6000	0,6 - 0,9	0/-15	6	10	0,16
10	0,62	WV 10	6000	0,7 - 1,0	0/-15	6	10	0,12
12	0,89	WV 12	6000	0,8 - 1,2	0/-18	8	12	0,12
13	1,04	WV 13	6000	0,8 - 1,2	0/-18	8	12	0,12
14	1,21	WV 14	6000	0,9 - 1,3	0/-18	8	12	0,12
15	1,39	WV 15	6000	1,0 - 1,4	0/-18	8	12	0,12
16	1,58	WV 16	6000	1,1 - 1,5	0/-18	8	12	0,1
18	2,00	WV 18	6000	1,1 - 1,5	0/-18	8	12	0,1
20	2,46	WV 20	6000	1,2 - 1,5	0/-21	9	12	0,1
22	2,98	WV 22	6000	1,2 - 1,5	0/-21	9	12	0,1
24	3,55	WV 24	6000	1,4 - 1,6	0/-21	9	12	0,1
25	3,85	WV 25	6000	1,5 - 1,7	0/-21	9	12	0,1
28	4,83	WV 28	6000	1,5 - 1,8	0/-21	9	12	0,1
30	5,55	WV 30	6000	1,5 - 1,9	0/-21	11	12	0,1
32	6,31	WV 32	6000	1,5 - 1,9	0/-25	11	15	0,1
35	7,55	WV 35	6000	1,5 - 1,9	0/-25	11	15	0,1
40	9,86	WV 40	6000	1,6 - 2,0	0/-25	11	15	0,1
45	12,48	WV 45	6000	1,6 - 2,0	0/-25	11	15	0,1
50	15,41	WV 50	6000	2,2 - 2,6	0/-25	11	15	0,1
55	18,64	WV 55	6000	2,2 - 2,6	0/-30	12	15	0,1
60	22,18	WV 60	6000/7000	2,2 - 2,6	0/-30	12	15	0,1
65	26,03	WV 65	6000/7000	2,2 - 2,6	0/-30	12	15	0,1
70	30,19	WV 70	6000/7000	2,2 - 2,6	0/-30	12	15	0,1
75	34,66	WV 75	6000/7000	2,2 - 2,6	0/-30	12	15	0,1
80	39,44	WV 80	6000/7000	2,2 - 2,6	0/-30	12	15	0,1
90	49,91	WV 90	6000/7000	2,2 - 3,2	0/-35	14	17	0,2
100	61,62	WV 100	6000/7000	2,2 - 3,2	0/-35	14	17	0,2
120	88,73	WV 120	6000/7000	2,5 - 4,0	0/-35	14	17	0,2

Other specs

Surface hardness

62±2 HRC

Surface roughness

Ra max 0,2 µm

Length tolerance

0/+200 mm

Chrome layer thickness

min. 10 µm

Chrome layer hardness

min. 900 HV_(0.1)

Packaging

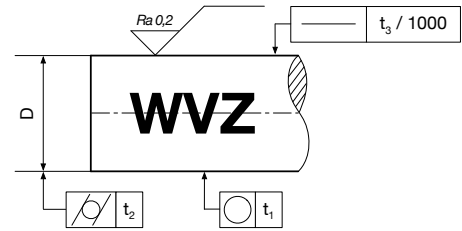
Standard: plastic sleeve, bundle

Upon request: wooden box, seaworthy packaging, Branorost, Lamiflex



Induction hardened chrome plated and ground linear shafts, inch size

Steel grade
Cf53



Diam.	Diam.	Weight	Product code	Standard length	Hardness depth SHD	Standard tolerance	Roundness	Parallelism	Straightness
D	D	Kg/m		L	DIN ISO 15787	classe "L"	t ₁	t ₂	t ₃
pollici	mm			pollici	pollici	pollici	pollici	pollici	pollici
1/4	6,35	0,25	WVZ 6	237	0,019 - 0,031	-0,0005/-0,001	0,0002	0,0002	0,008
3/8	9,525	0,56	WVZ 9	237	0,027 - 0,039	-0,0005/-0,001	0,0002	0,0002	0,008
1/2	12,7	0,99	WVZ 12	237	0,031 - 0,047	-0,0005/-0,001	0,0002	0,0003	0,008
5/8	15,875	1,55	WVZ 15	237	0,043 - 0,059	-0,0005/-0,001	0,0002	0,0003	0,008
3/4	19,05	2,24	WVZ 19	237	0,047 - 0,059	-0,0005/-0,001	0,0002	0,0004	0,008
1	25,4	3,98	WVZ 25	237	0,059 - 0,066	-0,0005/-0,001	0,0002	0,0004	0,008
1 ¼	31,75	6,21	WVZ 31	237	0,059 - 0,074	-0,0005/-0,001	0,0003	0,0004	0,004
1 ½	38,1	8,94	WVZ 38	237	0,062 - 0,078	-0,0006/-0,0011	0,0003	0,0004	0,004
2	50,8	15,90	WVZ 50	237	0,086 - 0,102	-0,0006/-0,0013	0,0003	0,0004	0,004
2 ¼	57,15	20,13	WVZ 57	237	0,086 - 0,102	-0,0007/-0,0015	0,0003	0,0005	0,004
2 ½	63,5	24,85	WVZ 63	237 - 276	0,086 - 0,102	-0,0007/-0,0015	0,0003	0,0005	0,004
3	76,2	35,78	WVZ 76	237 - 276	0,086 - 0,102	-0,0008/-0,0017	0,0003	0,0005	0,004

Other specs

Surface hardness
62±2 HRC

Surface roughness
Ra max 0,2 µm

Length tolerance
0/+8" (0/+200 mm)

Chrome layer thickness
min. 10 µm

Chrome layer hardness
min. 900 HV_(0,1)

Packaging

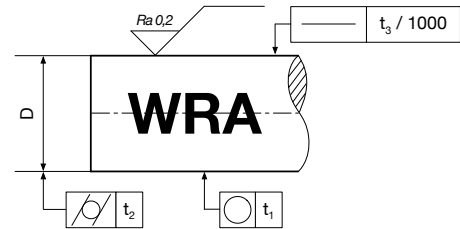
Standard: plastic sleeve, bundle
Upon request: wooden box, seaworthy packaging, Branorost, Lamiflex



Induction hardened and ground linear shafts, stainless steel

Steel grade

X90CrMoV18



Diameter	Weight	Product code	Standard length	Hardness depth SHD	Standard tolerance	Roundness	Parallelism	Straightness
D			L	DIN ISO 15787	h6	t ₁	t ₂	t ₃
mm	Kg/m		mm	mm	µm	µm	µm	mm/m
5	0,15	WRA 5	6000	0,5 - 0,8	0/-8	4	5	0,16
6	0,22	WRA 6	6000	0,5 - 0,8	0/-8	4	6	0,16
8	0,39	WRA 8	6000	0,6 - 0,9	0/-9	4	6	0,16
10	0,62	WRA 10	6000	0,7 - 1,0	0/-9	4	6	0,16
12	0,89	WRA 12	6000	0,8 - 1,2	0/-11	5	8	0,12
14	1,21	WRA 14	6000	0,9 - 1,3	0/-11	5	8	0,12
15	1,39	WRA 15	6000	1,0 - 1,4	0/-11	5	8	0,12
16	1,58	WRA 16	6000	1,1 - 1,5	0/-11	5	8	0,12
20	2,46	WRA 20	6000	1,2 - 1,5	0/-13	6	9	0,1
25	3,85	WRA 25	6000	1,5 - 1,7	0/-13	6	9	0,1
30	5,55	WRA 30	6000	1,5 - 1,9	0/-13	6	9	0,1
40	9,86	WRA 40	6000	1,6 - 2,0	0/-16	8	11	0,1
50	15,41	WRA 50	6000	2,2 - 2,6	0/-16	8	11	0,1
60	22,18	WRA 60	6000/7000	2,2 - 2,6	0/-19	9	13	0,1

Other specs

Surface hardness

55±3 HRC

Surface roughness

Ra max 0,2 µm

Length tolerance

0/+200 mm

Packaging

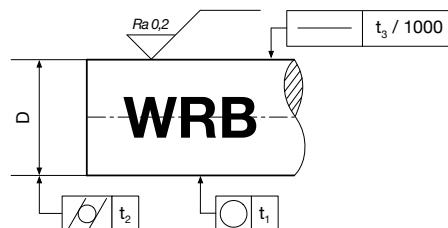
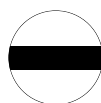
Standard: protective oil, bundle

Upon request: wooden box, seaworthy packaging, Branorost, Lamiflex



Induction hardened and ground linear shafts, stainless steel

Steel grade
X46Cr13



Diameter	Weight	Product code	Standard length	Hardness depth SHD	Standard tolerance	Roundness	Parallelism	Straightness
D			L	DIN ISO 15787	h6	t ₁	t ₂	t ₃
mm	Kg/m		mm	mm	µm	µm	µm	mm/m
5	0,15	WRB 5	6000	0,5 - 0,8	0/-8	4	5	0,16
6	0,22	WRB 6	6000	0,5 - 0,8	0/-8	4	6	0,16
8	0,39	WRB 8	6000	0,6 - 0,9	0/-9	4	6	0,16
10	0,62	WRB 10	6000	0,7 - 1,0	0/-9	4	6	0,16
12	0,89	WRB 12	6000	0,8 - 1,2	0/-11	5	8	0,12
14	1,21	WRB 14	6000	0,9 - 1,3	0/-11	5	8	0,12
15	1,39	WRB 15	6000	1,0 - 1,4	0/-11	5	8	0,12
16	1,58	WRB 16	6000	1,1 - 1,5	0/-11	5	8	0,12
20	2,46	WRB 20	6000	1,2 - 1,5	0/-13	6	9	0,1
25	3,85	WRB 25	6000	1,5 - 1,7	0/-13	6	9	0,1
30	5,55	WRB 30	6000	1,5 - 1,9	0/-13	6	9	0,1
40	9,86	WRB 40	6000	1,6 - 2,0	0/-16	8	11	0,1
50	15,41	WRB 50	6000	2,2 - 2,6	0/-16	8	11	0,1
60	22,18	WRB 60	6000/7000	2,2 - 2,6	0/-19	9	13	0,1

Other specs

Surface hardness
54±3 HRC

Surface roughness
Ra max 0,2 µm

Length tolerance
0/+200 mm

Packaging

Standard: protective oil, bundle
Upon request: wooden box, seaworthy packaging, Branorost, Lamiflex

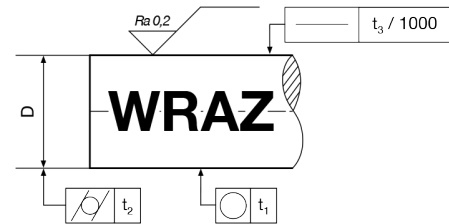


Induction hardened and ground linear shafts, stainless steel, inch size

Steel grade
X90CrMoV18



WRAZ



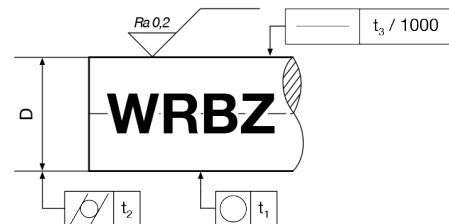
Diameter		Weight	Product code	Standard length	Hardness depth SHD	Standard tolerance	Roundness	Parallelism	Straightness
D				L	DIN ISO 15787	classe "L"	t ₁	t ₂	t ₃
pollici	mm	Kg/m		pollici	pollici	pollici	pollici	pollici	pollici
1/4	6,35	0,25	WRAZ 6	237	0,019 - 0,031	-0,0005/-0,001	0,0002	0,0002	0,008
3/8	9,525	0,56	WRAZ 9	237	0,027 - 0,039	-0,0005/-0,001	0,0002	0,0002	0,008
1/2	12,7	0,99	WRAZ 12	237	0,031 - 0,047	-0,0005/-0,001	0,0002	0,0003	0,008
5/8	15,875	1,55	WRAZ 15	237	0,043 - 0,059	-0,0005/-0,001	0,0002	0,0003	0,008
3/4	19,05	2,24	WRAZ 19	237	0,047 - 0,059	-0,0005/-0,001	0,0002	0,0004	0,008
1	25,4	3,98	WRAZ 25	237	0,059 - 0,066	-0,0005/-0,001	0,0002	0,0004	0,008
1 ¼	31,75	6,21	WRAZ 31	237	0,059 - 0,074	-0,0005/-0,001	0,0003	0,0004	0,004
1 ½	38,1	8,94	WRAZ 38	237	0,062 - 0,078	-0,0006/-0,0011	0,0003	0,0004	0,004
2	50,8	15,90	WRAZ 50	237	0,086 - 0,102	-0,0006/-0,0013	0,0003	0,0004	0,004
2 ¼	57,15	20,13	WRAZ 57	237	0,086 - 0,102	-0,0007/-0,0015	0,0003	0,0005	0,004

Induction hardened and ground linear shafts, stainless steel, inch size

Steel grade
X46Cr13



WRBZ



Diameter		Weight	Product code	Standard length	Hardness depth SHD	Standard tolerance	Roundness	Parallelism	Straightness
D				L	DIN ISO 15787	classe "L"	t ₁	t ₂	t ₃
pollici	mm	Kg/m		pollici	pollici	pollici	pollici	pollici	pollici
1/4	6,35	0,25	WRBZ 6	237	0,019 - 0,031	-0,0005/-0,001	0,0002	0,0002	0,008
3/8	9,525	0,56	WRBZ 9	237	0,027 - 0,039	-0,0005/-0,001	0,0002	0,0002	0,008
1/2	12,7	0,99	WRBZ 12	237	0,031 - 0,047	-0,0005/-0,001	0,0002	0,0003	0,008
5/8	15,875	1,55	WRBZ 15	237	0,043 - 0,059	-0,0005/-0,001	0,0002	0,0003	0,008
3/4	19,05	2,24	WRBZ 19	237	0,047 - 0,059	-0,0005/-0,001	0,0002	0,0004	0,008
1	25,4	3,98	WRBZ 25	237	0,059 - 0,066	-0,0005/-0,001	0,0002	0,0004	0,008
1 ¼	31,75	6,21	WRBZ 31	237	0,059 - 0,074	-0,0005/-0,001	0,0003	0,0004	0,004
1 ½	38,1	8,94	WRBZ 38	237	0,062 - 0,078	-0,0006/-0,0011	0,0003	0,0004	0,004
2	50,8	15,90	WRBZ 50	237	0,086 - 0,102	-0,0006/-0,0013	0,0003	0,0004	0,004
2 ¼	57,15	20,13	WRBZ 57	237	0,086 - 0,102	-0,0007/-0,0015	0,0003	0,0005	0,004

Other specs

Surface hardness WRAZ
55±3 HRC

Surface hardness WRBZ 54±3
HRC

Length tolerance
0/+8" (0/+200 mm)

Packaging

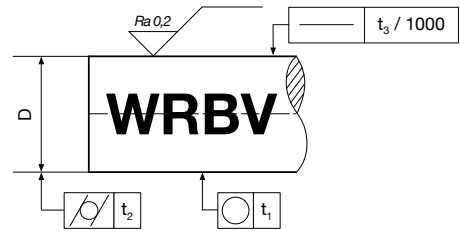
Standard: protective oil, bundle
Upon request: wooden box, seaworthy packaging, Branorost, Lamiflex



CROMSTEEL

Induction hardened, chrome plated and ground linear shafts, stainless steel

Steel grade
X46Cr13



Diameter	Weight	Product code	Standard length	Hardness depth SHD	Standard tolerance	Roundness	Parallelism	Straightness
D			L	DIN ISO 15787	h7	t ₁	t ₂	t ₃
mm	Kg/m		mm	mm	µm	µm	µm	mm/m
5	0,15	WRBV 5	6000	0,5 - 0,8	0/-12	6	10	0,16
6	0,22	WRBV 6	6000	0,5 - 0,8	0/-12	6	10	0,16
8	0,39	WRBV 8	6000	0,6 - 0,9	0/-15	7	10	0,16
10	0,62	WRBV 10	6000	0,7 - 1,0	0/-15	7	10	0,12
12	0,89	WRBV 12	6000	0,8 - 1,2	0/-18	8	12	0,12
14	1,21	WRBV 14	6000	0,9 - 1,3	0/-18	8	12	0,12
15	1,39	WRBV 15	6000	1,0 - 1,4	0/-18	8	12	0,12
16	1,58	WRBV 16	6000	1,1 - 1,5	0/-18	8	12	0,12
20	2,46	WRBV 20	6000	1,2 - 1,5	0/-21	10	12	0,1
25	3,85	WRBV 25	6000	1,5 - 1,7	0/-21	10	12	0,1
30	5,55	WRBV 30	6000	1,5 - 1,9	0/-21	10	12	0,1
40	9,86	WRBV 40	6000	1,6 - 2,0	0/-25	12	15	0,1
50	15,41	WRBV 50	6000	2,2 - 2,6	0/-25	12	15	0,1
60	22,18	WRBV 60	6000/7000	2,2 - 2,6	0/-30	15	15	0,1

Other specs

Surface hardness
54±3 HRC

Surface roughness
Ra max 0,2 µm

Length tolerance
0/+200 mm

Chrome layer thickness
min. 10 µm

Chrome layer hardness
min. 900 HV_(0.1)

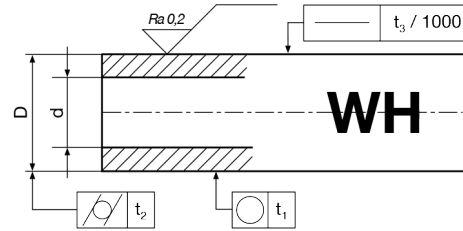
Packaging

Standard: plastic sleeve, bundle
Upon request: wooden box, seaworthy packaging, Branorost, Lamiflex



Induction hardened and ground linear shafts, hollow

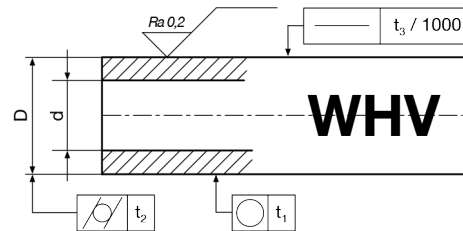
Steel grade
C60



Outer diameter D	Inner diameter d	Weight Kg/m	Product code	Standard length L	Hardness depth SHD DIN ISO 15787	Standard tolerance h6	Roundness t ₁	Parallelism t ₂	Straightness t ₃
mm	mm			mm	mm	µm	µm	µm	mm/m
12	4	0,79	WH 12	6000	0,6 - 1,3	0/-11	5	8	0,12
14	7	0,91	WH 14	6000	0,6 - 1,3	0/-11	5	8	0,12
16	7	1,28	WH 16	6000	0,6 - 1,6	0/-11	5	8	0,12
20	14	1,26	WH 20	6000	0,9 - 1,6	0/-13	6	9	0,1
25	15,6	2,35	WH 25	6000	0,9 - 1,8	0/-13	6	9	0,1
30	18,3	3,48	WH 30	6000	0,9 - 2,0	0/-13	6	9	0,1
40	28	5,03	WH 40	6000	1,5 - 2,5	0/-16	7	11	0,1
50	29,7	9,97	WH 50	6000	1,5 - 3,0	0/-16	7	11	0,1
60	36	14,20	WH 60	6000	2,2 - 3,0	0/-16	8	13	0,1

Induction hardened, chrome plated and ground linear shafts, hollow

Steel grade
C60



Outer diameter D	Inner diameter d	Weight Kg/m	Product code	Standard length L	Hardness depth SHD DIN ISO 15787	Standard tolerance h7	Roundness t ₁	Parallelism t ₂	Straightness t ₃
mm	mm			mm	mm	µm	µm	µm	mm/m
12	4	0,79	WHV 12	6000	0,6 - 1,3	0/-18	8	12	0,12
14	7	0,91	WHV 14	6000	0,6 - 1,3	0/-18	8	12	0,12
16	7	1,28	WHV 16	6000	0,6 - 1,6	0/-18	8	12	0,12
20	14	1,26	WHV 20	6000	0,9 - 1,6	0/-21	9	12	0,1
25	15,6	2,35	WHV 25	6000	0,9 - 1,8	0/-21	9	12	0,1
30	18,3	3,48	WHV 30	6000	0,9 - 2,0	0/-21	9	12	0,1
40	28	5,03	WHV 40	6000	1,5 - 2,5	0/-25	11	15	0,1
50	29,7	9,97	WHV 50	6000	1,5 - 3,0	0/-25	11	15	0,1
60	36	14,20	WHV 60	6000	2,2 - 3,0	0/-30	12	15	0,1

Other specs

Surface hardness
62±2 HRC

Surface roughness
Ra max 0,2 µm

Length tolerance
0/+200 mm

Chrome layer thickness (only WHV)
min. 10 µm

Chrome layer hardness (only WHV)
min. 900 HV_(0.1)

Packaging

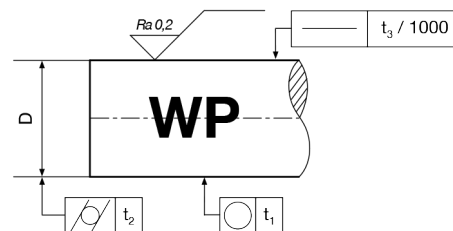
Standard (WH): protective oil, bundle
Standard (WHV): plastic sleeve, bundle
Upon request: wooden box, seaworthy packaging, Branorost, Lamiflex



Induction hardened shafts for ball screws

Steel grade

50CrMo4 +QT / 100Cr6

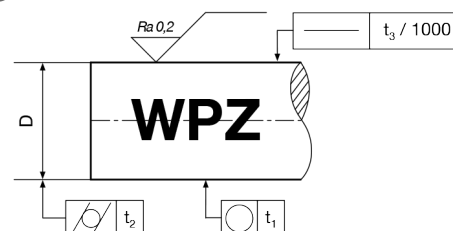


Diameter	Weight	Product code	Standard length	Standard tolerance	Roundness	Parallelism	Straightness
D	Kg/m		L	h6	t ₁	t ₂	t ₃
mm			mm	μm	μm	μm	mm/m
20	2,46	WP 20	6000	0/-13	6	8	0,2
25	3,85	WP 25	6000	0/-13	6	9	0,2
28	4,83	WP 28	6000	0/-13	6	9	0,2
32	6,31	WP 32	6000	0/-16	7	11	0,2
36	7,99	WP 36	6000	0/-16	7	11	0,2
40	9,86	WP 40	6000	0/-16	7	11	0,2
45	12,48	WP 45	6000	0/-16	7	11	0,2
50	15,41	WP 50	6000	0/-16	7	11	0,2
55	18,64	WP 55	6000	0/-19	8	13	0,2
60	22,18	WP 60	6000	0/-19	8	13	0,2
63	24,46	WP 63	6000	0/-19	8	13	0,2
70	30,19	WP 70	6000	0/-19	8	13	0,2
80	39,44	WP 80	6000	0/-19	8	13	0,2
100	61,62	WP 100	6000	0/-22	11	13	0,2
120	88,73	WP 120	6000	0/-22	11	16	0,2

Induction hardened shafts for ball screws, inch size

Steel grade

50CrMo4 +QT / 100Cr6



Diameter	Diameter	Weight	Product code	Standard length	Standard tolerance	Roundness	Parallelism	Straightness
D	D	Kg/m		L	tolerance classe "L"	t ₁	t ₂	t ₃
pollici	mm			pollici	pollici	pollici	pollici	pollici
3/4	19,05	2,24	WPZ 19	237"	-0,0005/-0,001	0,0002	0,0004	0,008
1	25,4	3,98	WPZ 25	237"	-0,0005/-0,001	0,0002	0,0004	0,008
1 ¼	31,75	6,21	WPZ 31	237"	-0,0005/-0,001	0,0003	0,0005	0,004
1 ½	38,1	8,94	WPZ 38	237"	-0,0006/-0,0011	0,0003	0,0005	0,004
2	50,8	15,90	WPZ 50	237"	-0,0006/-0,0013	0,0003	0,0005	0,004
2 ½	63,5	24,85	WPZ 63	237"	-0,0007/-0,0015	0,0004	0,0006	0,004
3	76,2	35,78	WPZ 76	237"	-0,0008/-0,0017	0,0005	0,0008	0,004
3 ½	88,9	48,70	WPZ 88	237"	-0,0010/-0,0020	0,0005	0,0008	0,004
4	101,6	63,61	WPZ 101	237"	-0,0012/-0,0024	0,0006	0,0010	0,004

Other specs

Surface hardness
62±2 HRC

Surface roughness
Ra max 0,2 μm

Length tolerance
0/+200 mm (metric)
0/+8" (imperial)

Profondità di tempra
According to customer specs

Codice colore
According to customer specs

Packaging

Standard: protective oil, bundle
Upon request: wooden box, seaworthy packaging, Branorost, Lamiflex



CROMSTEEL



This catalogue replaces and supersedes the previous ones.

Cromsteel Italia S.r.l. reserves the right, at its discretion, to cease production of one or more products or modify the specifications of one or more products, without prior notice and without assuming responsibility for it. All information and specifications supplied by Cromsteel Italia S.r.l. or by its staff and commercial partners are aimed at professional users with specific technical knowledge. The user must diligently check if the chosen product fits the application on the basis of his own specific requirements (safety, usage etc.).

All rights reserved.

Cromsteel Italia S.r.l.
Via Terracini 24
51031 Agliana (PT)
Italy

LINEAR SHAFTS
CATALOGUE
2020
© *CROMSTEEL ITALIA S.R.L.*

www.cromsteel.it
Tel. +39 0574 793382
Fax +39 0574 799239
email: info@cromsteel.it



CROMSTEEL

Chrome Bars, Cylinder Tubes, Linear Shafts