



Induction Hardened and Hard Chrome Plated Hollow Linear Shafts

OUTER DIAMETER 20-60 mm, INSIDE DIAMETER 14-36 mm

STEEL GRADES

Steel Grade	DIN	B.S	UNI	JIS	GOST	ASI/SAE/ASTM	Werkstoff
C60E	Ck60	070M60	C60	S58C	60	1060	1,1221

CHEMICAL COMPOSITION - IN % BY WEIGHT

Steel Grade	C	Si	Mn	P	S	Cr	Mo	Ni	Cu	V	N
C60E	0.57-0.65	0.10-0.40	0.60-0.90	≤0.025	≤0.035	≤0.4	≤0.1	–	–	–	–

MECHANICAL PROPERTIES

Steel Grade	OD	Tensile Strength N/mm ²	Yield Strength N/mm ²	Elongation A%	Tristar Steel Product Code
C60E+N	12-50 mm	720-900	Min.390	Min.13	STAR WHV

STRAIGHTNESS

OD 12 ≤ Ø ≤ 16mm: max. 0.3 mm/1000 mm
OD 20 ≤ Ø ≤ 50mm: max. 0.20 mm/1000 mm
OD 60 ≤ Ø ≤ 80mm: max. 0.15 mm/1000 mm

ROUNDNESS

OD 12 ≤ Ø ≤ 16mm: max. 5 µm
OD 20 ≤ Ø ≤ 30mm: max. 6 µm
OD 40 ≤ Ø ≤ 50mm: max. 7 µm
OD 60 mm: max. 8 µm
OD 80 mm: max. 10 µm

SURFACE HARDNESS

Surface hardness beneath the chrome layer
C60E+ N 62+/-2 HRC

TOLERANCE

h7, other on request

STANDARD LENGTH

6000 mm, other on request

SURFACE ROUGHNESS

Ra: max. 0.15 µm

CHROME LAYER THICKNESS

12 ± 5 µm

CHROME LAYER MICROHARDNESS

900 HV0.1

OD / ID (mm)	Hardening Depth (mm)
20 / 14	min. 0.6
25 / 15	min. 0.9
30 / 18	min. 0.9
40 / 28	min. 1.2
40 / 26	min. 1.2
50 / 30	min. 1.5
60 / 36	min. 1.5