

Hard Chrome Plated Shafting Specifications

Chrome Plated Shafting

Grade & Strength

Our chrome plated shafting is produced from C45 and C50 steel which is virtually the same as AISI 1045/1050 steel. The yield point is 320MPa (46,400 psi) and the Ultimate Tensile Strength (UTS) is 520 MPa minimum (75,400 psi minimum).

Roundness and Straightness

The out of roundness tolerance is 1/2 of the ISO 286-2 f7 fi eld for shafts greater than 20mm and 1/2 of the ISO 286-2 f8 fi eld for shafts 20mm and smaller. Straightness is better than 0.5mm/2000mm.

Surface Roughness

The surface roughness is RMS 8 or better. (Nominal values Ra less than or equal to 0.2um).

Thickness of Chrome Plating

The chromium layer on shafting 20mm and less in diameter is 14um minimum (0.00055") and greater than 20mm is 20um minimum (0.00078").

Surface Hardness

The Rockwell hardness of the chrome plating itself is HR C66-69.

The Rockwell hardness of the surface of the Non-Induction hardened bars UNDER the chromium overlay on C45/C50 Steel is a Rockwell hardness of B80/99.

The Rockwell hardness of the Induction Hardened bars UNDER the chromium overlay on C45/50 steel is a Rockwell hardness of C54/60.

The surface hardness of DIN 42CrMo4 quench and tempered alloy steel under the chromium layer on the non induction hardened steel is 0.1 Hardness Vickers 620 to 750. This corresponds to RockWell C 32 to 38.

Corrosion Resistance of the Chromium Layer

Corrosion Resistance on carbon, alloy, and induction hardened steel is 200 hour in a neutral salt spray tests with a rating of 9 minimum. The laboratory test is according to ISO 9227 (NSS) and results evaluation are according to ISO10.289.

Depth of Induction Hardening

Diameters	Metric Tolerances	Inch Tolerances
Greater than 16mm-20mm	1.0mm +/-0.5mm	0.039"/+/-0.020"
Greater than 20mm-40mm	1.5mm +/-0.5mm	0.059"/+/-0.020"
Greater than 40mm-80mm	2.0mm +/-0.5mm	0.079"/+/-0.020"
Greater than 80mm-140mm	2.5mm +/-0.5mm	0.098"/+/-0.020"

Chrome Plated Shafting Diameter Tolerance

The diameter tolerance of the chrome plated shafting 16mm and greater is ISO 286-2 lower case f7 which is a double undersize

Bar Above	Dia. (mm) Up to and Including	ISO 286-2 Lowercase f8 f8 Double undersized for shafting
3	6	-0.010mm/-0.028mm (-0.00039"/-0.00110")
6	10	-0.013mm/-0.035mm (-0.00051"/-0.00137")
10	18	-0.016mm/-0.043mm (-0.00063"/-0.00169")
18	20	-0.020mm/-0.053mm (-0.00078"/-0.00209")

Bar Above	Dia. (mm) Up to and Including	ISO 286-2 Lowercase f7 f7 Double undersized for shafting
20	30	-0.020mm/-0.041mm (-0.00078"/-0.0016")
30	50	-0.025mm/-0.050mm (-0.00098"/-0.0026")
50	80	-0.030mm/-0.060mm (-0.00118"/-0.0024")
80	120	-0.036mm/-0.071mm (-0.00142"/-0.0028")
120	180	-0.043mm/-0.083mm (-0.00169"/-0.0033")
180	250	-0.050mm/-0.096mm (-0.00197"/-0.0038")

High Strength 100,000 min. PSI

This material is produced from Euronorm/DIN 42CrMo4 steel which is very similar to AISI/ASTM 4140 and is quenched and tempered. It is stocked in both the induction hardened and non induction hardened condition.

Mechanical Properties of High Strength Shafting

Diameters	Minimum Yield	U.T.S.
16mm to 120mm	106,000 psi	130,491 to 166,739 psi
120mm to 140mm	100,000 psi	123,242 to 166,739 psi

Chemistry Comparisons

Grade	C%	Mn %	P%	S %	Cr%	Mo%
1045	0.43/0.50	0.60/0.90	0.04	0.05		
C45 & Ck45	0.42/0.50	0.50/0.80	0.035	0.035		
1050	0.48/0.55	0.60/0.90	0.04	0.05		
C50 & Ck50	0.47/0.55	0.60/0.90	0.035	0.035		
4140	0.38/0.43	0.75/1.00	0.035	0.04	0.80/1.10	0.15/0.25
42CrMo4	0.38/0.45	0.60/0.90	0.035	0.035	0.90/1.20	0.15/0.30
SCM 440	0.38/0.43	0.60/0.90	0.03	0.03	0.90/1.20	0.15/0.30
42CrMo	0.38/0.45	0.50/0.80	0.035	0.035	0.90/1.20	0.15/0.25
B7/B7M	0.37/0.49	0.65/1.10	0.035	0.04	0.75/1.10	0.15/0.35

Silicon in 4140, SCM 440, and 42CrMo is 0.15/0.35% and in 42CrMo4, B7 and B7M are 0.40% maximum. The numbers 1045, 1050, 4140, B7 and B7M are American grades SAE/ASTM/AISI. The number letter combinations C45, Ck45, C50, Ck50 and 42CrMo4 are both Euronorm EN10083 and DIN standards. Lower case k stands for cold drawn. SCM 440 is a Japanese JIS G grade and 42CrMo is a Chinese GB grade.

Induction Hardened Shafting Specifications

Surface Hardness

The 1045 induction hardened bars have a case hardness of rockwell C 50/60 and the 1060 induction hardened bars have a case hardness of rockwell C 60/65.

Depth of Hardness

our induction hardened bars 1045 and 1060 have a case hardened depth range of 0.060" /0.090"