



Chrome Plated Steel Bars in the Japanese Standard : CASS

DIAMETER 20 - 56 mm



Induction Hardened and Chrome Plated Steel Bars in the Japanese Standard : CASS

DIAMETER 20 - 56 mm

STEEL GRADES

Steel Grade	DIN	B.S	UNI	JIS	GOST	ASI/SAE/ASTM	Werkstoff
C45E	Ck45	080M46	C45	S45C	45	1045	1.1191
C35E	Ck35	080M36	C35	S35C	35	1035	1.1181
20MnV6	20MnV6	55M	-	-	-	A572	1.5217
38MnVS6	38MnSiVS5	-	-	-	-	(15V41)'	1.3303
42CrMo4	42CrMo4	708M40	42CrMo4	SCM440(H)	40ChFA	4140	1.7225

CHEMICAL COMPOSITION - IN % BY WEIGHT

Steel Grade	C	Si	Mn	P	S	Cr	Mo	Ni	Cu	V	N
C45E	0.42-0.50	0.10-0.40	0.50-0.80	0,045	0,045	≤0.40	≤0.10	≤0.40	≤0.30	-	-
C35E	0.32-0.39	0.10-0.40	0.50-0.80	0,045	0,045	≤0.40	≤0.10	≤0.40	≤0.30	-	-
20MnV6	0.16-0.22	0.15-0.80	1.20-1.60	≤0.025	≤0.035	-	-	-	-	0.1-0.2	-
20MnV6x	0.17-0.22	0.15-0.80	1.20-1.60	≤0.025	≤0.035	-	-	-	-	0.1-0.2	-
38MnVS6	0.34-0.41	0.15-0.80	1.20-1.60	≤0.025	≤0.060	≤0.30	≤0.08	-	-	0.1-0.2	0.1-0.2
38MnVS6x	0.35-0.41	0.15-0.80	1.20-1.60	≤0.025	0.20-0.60	≤0.30	≤0.08	-	-	0.1-0.2	0.1-0.2
42CrMo4	0.38-0.45	0.10-0.40	0.60-0.90	≤0.025	≤0.035	0.9-1.2	0.15-0.30	-	≤0.40	-	-

MECHANICAL PROPERTIES

Steel Grade	Diameter	Tensile Strength N/mm ²	Yield Strength N/mm ²	Elongation A%	Impact Energy J/Min.	Hardness Brinell HB	Norm	Tristar Steel Product Code
C45E	20<0≤25 25<0≤56	650-1000 Min. 580	Min. 410 Min. 305	Min. 7 Min. 16	- -	200-298 172-242	EN 10277 EN ISO683-1	STAR CS
C35E	20<0≤25 25<0≤56	580-880 Min.520	Min. 320 Min. 270	Min. 8 Min. 19	- -	172-263 154-207	EN 10277 EN ISO683-1	STAR CSX
20MnV6	20≤0≤25.6 26≤0≤56	Min.570 550-750	Min. 470 Min. 450	Min. 11 Min. 19	27/-20 °C 27/-20 °C	Min.175 167-227	Internal Form Internal Form	STAR CSA
20MnV6x	20≤0≤56	Min.620	Min. 570	Min. 19	27/-20 °C	Min.187	Internal Form	STAR CSAX
38MnVS6	20≤0≤56	800-950	Min. 520	Min. 12	-	242-287	Internal Form	STAR CSB
38MnVS6x	20≤0≤56	850-1000	Min. 600	Min. 14	-	257-303	Internal Form	STAR CSBX
42CrMo4	20≤0≤25.6 26<0≤40 40<Ø<55 55<Ø<56	1000-1200 1000-1200 900-1100 800-950	Min. 720 Min. 750 Min. 650 Min. 550	Min. 9 Min. 11 Min. 12 Min. 13	- 27/-20 °C 27/-20 °C 27/-20 °C	303-360 303-360 303-360 242-287	EN ISO683-2 EN ISO683-2 EN ISO683-2 EN ISO683-2	STAR CSC

STAR**CS****STRAIGHTNESS**

20 ≤ Ø ≤ 56 mm: Max. 0.20 mm/1000 mm

ROUNDNESS

Max. ½ from Dia. Tolerance

CHROME LAYER THICKNESS

Double Chrome

STANDARD LENGTH5800 - 7500 mm
(Available on request)**SURFACE ROUGHNESS**

Ra: max. 0.15 µm; Rt: max. 1.5 µm

CHROME LAYER MICROHARDNESS

Min. 900 HV0.1

CORROSION RESISTANCECASS test according to ISO 9227 -
Evaluation according to ISO 10289 :**RATING 10 (NO RUST)****64 hours****STAR****ICS**

Diameter (mm)	C45E Hardening Depth (mm)	20MnV6 Hardening Depth (mm)	38MnVS6 Hardening Depth (mm)	42CrMo4+QT Hardening Depth (mm)
20	1.2-1.6	1.0-2.0	1.2-1.6	1.2-1.5
22-25.4	1.3-1.7	1.0-2.0	1.2-1.6	1.4-1.7
28	1.5-1.8	1.0-2.0	1.4-1.8	1.5-1.8
28,575	1.5-1.8	1.0-2.0	1.4-1.8	1.5-1.8
30-36	1.5-1.8	1.0-2.0	1.5-1.9	1.5-1.8
38-40	1.5-1.9	1.0-2.0	1.6-2.0	1.5-1.9
42-45	1.7-2.3	1.3-2.5	1.6-2.0	1.7-2.3
48-56	2.2-2.6	1.3-2.5	1.8-2.5	2.2-2.6

SURFACE HARDNESSSurface Hardness beneath
the chrome layer

C45E	58±3 HRC
C35E	50±3 HRC
20MnV6	Min. 42 HRC
20MnV6x	46±3 HRC
38MnV6	Min. 55 HRC
38MnV6x	59±3 HRC
42CrMo4+QT	59±3 HRC

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