

Material Grade: C40 (1.0511)

Other Variant(s): C40E (1.1186) – identical to C40, except for:
Max S%=0.035 and max P%=0.025 (ISO683-1) or max P%=0.030 (EN10083-2)
C40R (1.1189) – identical to C40, except for:
S%=0.020-0.040 and max P%=0.025 (ISO683-1) or max P%=0.030 (EN10083-2)
This variant is only applicable to rolled bar standards.

Associated standards:¹ BS EN ISO 683-1:2018 (current)
EN10083-2 (obsolete, all editions)
BS EN ISO683-7: 2024 (current)
ISO 683-18:2014 (current)
BS EN 10277:2018 (current)
BS EN 10250-2: 2022 (current)

Material Condition(s): No designation or +U – Untreated (as rolled)
+QT – Quench and tempered
+N – Normalised

Surface Finish: No designation or +HW – Black rolled
+RM – Rough machined – rough machined rolled or forged
+SH – Untreated and peeled/ turned (rolled bar)
+C – Cold drawn
+G – Ground

Typical tolerance(s):

Surface finish	Product type	Standard	Dimensional tolerance	Straightness	Clean-up
No designation/ +HW	Rolled bar	BS EN ISO683-1	EN10060	EN10060	ISO9443 Class A
+RM	Rolled bar + rough machined	BS EN ISO683-1	EN10060	EN10060	ISO9443 Class A
+SH, +C, +G	Rolled bright bar	BS EN ISO683-7	Defined in 683-7	Defined in 683-7	Defined in 683-7
Any designation	Forged bar	BS EN10250-2	Per agreement	Per agreement	Per agreement

Other supply options: *(only applicable to rolled bar standards)*

+H - with an additional hardenability test for grades E and R only to the specified ranges of the standard
+HH - with an additional hardenability test (narrowed upper limit values as per standard) for grade variant E
+HL - with an additional hardenability test (narrowed lower limit values as per standard) for grade variant R

1. TYPICAL CHEMICAL COMPOSITION *(from the most current version of the standard(s))*

%	<u>C</u>	<u>Si</u>	<u>Mn</u>	<u>P</u>	<u>S</u>	<u>Cr</u>	<u>Mo</u>	<u>Ni</u>	<u>Cu</u>	<u>Cr+Mo+Ni</u>
Min	0.37	0.1	0.5	0	0	0	0	0	0	0
Max	0.44	0.4	0.8	0.045	0.045	0.4	0.1	0.4	0.3	0.63

2. TYPICAL MECHANICAL PROPERTIES (from the most current version of the standard(s))

	Test type				Tensile and hardness test (at room temperature)						Impact test (KCV) Average of 3 / individual value
					Yield (Re)	0.2 % proof	UTS (Rm)	Elong (A)	R of A (Z)	Hardnes s	Room Temp
	Condition	Nominal diameter <i>d</i> (mm)	Directio n	Unit	N/mm2	N/mm2	N/mm2	%	%	HB	J
BLACK ROLLED	Untreated (No designation or +U)	-	-	Min	-	-	-	-	-	-	-
				Max	-	-	-	-	-	-	-
	Quench and tempered +QT	≤ 16 ρ	L	Min	460	-	650	16	35	-	20/14
				Max	-	-	800	-	-	-	-
	Quench and tempered +QT	16<d≤ 40 ρ	L	Min	400	-	630	18	40	-	20/14
				Max	-	-	780	-	-	-	-
	Quench and tempered +QT	40<d≤ 100 ρ	L	Min	350	-	600	19	45	-	20/14
				Max	-	-	750	-	-	-	-
	Normalised +N	≤ 16 ρ	L	Min	320	-	580	16	-	-	-
				Max	-	-	-	-	-	-	-
	Normalised +N	16<d≤ 100 ρ	L	Min	290	-	550	17	-	-	-
				Max	-	-	-	-	-	-	-
Normalised +N	100<d≤ 250 ρ	L	Min	260	-	530	17	-	-	-	
			Max	-	-	-	-	-	-	-	
BRIGHT ROLLED	Untreated + peeled/turned +SH	16< d ≤ 100	L	Min	-	-	550	-	-	164	-
				Max	-	-	710	-	-	207	-
	Untreated, then cold drawn +C	5< d ≤ 10	L	Min	-	540	700	6	-	-	-
				Max	-	-	1000	-	-	-	-
	Untreated, then cold drawn +C	10< d ≤ 16	L	Min	-	460	650	7	-	-	-
				Max	-	-	980	-	-	-	-
	Untreated, then cold drawn +C	16< d ≤ 40	L	Min	-	365	620	8	-	-	-
				Max	-	-	920	-	-	-	-
	Untreated, then cold drawn +C	40< d ≤ 63	L	Min	-	330	590	9	-	-	-
				Max	-	-	840	-	-	-	-
	Untreated, then cold drawn +C	63< d ≤ 100	L	Min	-	290	550	9	-	-	-
				Max	-	-	820	-	-	-	-
	Quench and tempered, then peeled/turned +QT+SH	16< d ≤ 40	L	Min	-	400	630	18	-	-	30/21
				Max	-	-	780	-	-	-	-
	Quench and tempered, then peeled/turned +QT+SH	40< d ≤ 100	L	Min	-	350	600	19	-	-	30/21
				Max	-	-	750	-	-	-	-
	Quench and tempered, then cold drawn +QT+C	5< d ≤ 10	L	Min	-	560	800	8	-	-	-
				Max	-	-	1000	-	-	-	-
	Quench and tempered, then cold drawn +QT+C	10< d ≤ 16	L	Min	-	525	750	8	-	-	-
				Max	-	-	950	-	-	-	-
	Quench and tempered, then cold drawn +QT+C	16< d ≤ 40	L	Min	-	490	680	9	-	-	-
				Max	-	-	880	-	-	-	-
	Quench and tempered, then cold drawn +QT+C	40< d ≤ 63	L	Min	-	435	620	10	-	-	-
				Max	-	-	820	-	-	-	-
	Quench and tempered, then cold drawn +QT+C	63< d ≤ 100	L	Min	-	420	600	11	-	-	-
				Max	-	-	800	-	-	-	-
FORGED	Normalised +N	d≤ 100 ρ	L	Min	290	-	550	17	-	-	-
				Max	-	-	-	-	-	-	-
	Normalised +N	100<d<160 ρ	L	Min	260	-	530	17	-	-	-
				Max	-	-	-	-	-	-	-
	Normalised +N	160≤d≤ 250 ρ	T	Min	260	-	530	-	-	-	-
				Max	-	-	-	-	-	-	-

¹ valid at the time of writing.

Whilst great care and attention has been paid to compose this datasheet but we will not take the responsibility for any errors.