

MATERIAL DATASHEET

Title:

C40

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	0.3 7	0. 1	0. 5	0	0	0	0	0	0	0

 HILLFOOT <small>METALS SUPPLY CHAIN INNOVATION</small>	MATERIAL DATASHEET									
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Max	0.44	0.44	0.88	0.045	0.045	0.44	0.41	0.44	0.43	0.63
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2. TYPICAL MECHANICAL PROPERTIES *(from the most current version of the standard(s))*

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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)	Hardness	Room Temp	
Condition	Nominal diameter d (mm)	Direction	Unit	N/mm2	N/mm2	N/mm2	%	%	HB	J	
Untreated (No designation or +U)	-	-	Min	-	-	-	-	-	-	-	-
			Max	-	-	-	-	-	-	-	-
BLACKROLLED	Quench and tempered +Q T	≤ 16 _{mm}	Min	460	-	650	16	35	-	-	20/14
			Max	-	-	800	-	-	-	-	-
	Quench and tempered +Q T	16< d ≤ 40 _{mm}	Min	400	-	630	18	40	-	-	20/14
			Max	-	-	780	-	-	-	-	-
	Quench and tempered +Q T	40< d ≤ 100 _{mm}	Min	350	-	600	19	45	-	-	20/14
			Max	-	-	750	-	-	-	-	-
	Normalised +N	≤ 16 _{mm}	Min	320	-	580	16	-	-	-	-
			Max	-	-	-	-	-	-	-	-
	Normalised +N	16< d ≤ 100 _{mm}	Min	290	-	550	17	-	-	-	-
			Max	-	-	-	-	-	-	-	-
	Normalised +N	100< d ≤ 250 _{mm}	Min	260	-	530	17	-	-	-	-
			Max	-	-	-	-	-	-	-	-
BRIGHTROLLED	Untreated + peeled/turned +SH	16< d ≤ 100	Min	-	-	550	-	-	164	-	-
			Max	-	-	710	-	-	207	-	-
	Untreated, then cold drawn +C	5< d ≤ 10	Min	-	540	700	6	-	-	-	-
			Max	-	-	1000	-	-	-	-	-
	Untreated, then cold drawn +C	10< d ≤ 16	Min	-	460	650	7	-	-	-	-
			Max	-	-	980	-	-	-	-	-
	Untreated, then cold drawn +C	16< d ≤ 40	Min	-	365	620	8	-	-	-	-
			Max	-	-	920	-	-	-	-	-
	Untreated, then cold drawn +C	40< d ≤ 63	Min	-	330	590	9	-	-	-	-
			Max	-	-	840	-	-	-	-	-
	Untreated, then cold drawn +C	63< d ≤ 100	Min	-	290	550	9	-	-	-	-
			Max	-	-	820	-	-	-	-	-
	Quench and tempered, then peeled/turned +Q T+SH	16< d ≤ 40	Min	-	400	630	18	-	-	30/21	-
			Max	-	-	780	-	-	-	-	-
	Quench and tempered, then peeled/turned +Q T+SH	40< d ≤ 100	Min	-	350	600	19	-	-	30/21	-
			Max	-	-	750	-	-	-	-	-
	Quench and tempered, then cold drawn +Q T+C	5< d ≤ 10	Min	-	560	800	8	-	-	-	-
			Max	-	-	1000	-	-	-	-	-
	Quench and tempered, then cold drawn +Q T+C	10< d ≤ 16	Min	-	525	750	8	-	-	-	-
			Max	-	-	950	-	-	-	-	-
	Quench and tempered, then cold drawn +Q T+C	16< d ≤ 40	Min	-	490	680	9	-	-	-	-
			Max	-	-	880	-	-	-	-	-
	Quench and tempered, then cold drawn +Q T+C	40< d ≤ 63	Min	-	435	620	10	-	-	-	-
			Max	-	-	820	-	-	-	-	-
	Quench and tempered, then cold drawn +Q T+C	63< d ≤ 100	Min	-	420	600	11	-	-	-	-
			Max	-	-	800	-	-	-	-	-
FORGED	Normalised +N	d ≤ 100 _{mm}	Min	290	-	550	17	-	-	-	-
			Max	-	-	-	-	-	-	-	-
	Normalised +N	100< d ≤ 160 _{mm}	Min	260	-	530	17	-	-	-	-
			Max	-	-	-	-	-	-	-	-
	Normalised +N	160< d ≤ 250 _{mm}	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.