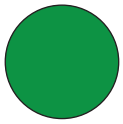
MACSTEEL®

Data Sheet

M 080M40

(0.40% CARBON STEEL)
SPECIFICATION - BS 970:Part 1:1983
Formerly known as EN 8 - BS 970:1955

GREEN:
As Rolled or As Forged Black Bar



Chemical composition limits

%	C	Si	Mn	S	P
Min	0.36	0.10	0.60	-	-
Max	0.44	0.40	1.00	0.050	0.050

Mechanical properties

Heat treated condition	LRS	Hardness	U.T.S.	Y.S.	0.2% P.S.	Elongation	Impact strength
	(mm)	(BHN)	(MPa)	(MPa)	(MPa)	(%)	(J)
Normalized	150	152 - 207*	550 min	280 min	-	16 min	16 min
Normalized	250	146 - 197*	510 min	245 min	-	17 min	-
Q	63	179 - 229	625 - 775	385 min	355 min	16 min	28 min
R	19	201 - 255	700 - 850	465 min	450 min	16 min	28 min

*Hardness is for guidance only

Heat treatment

- Normalizing - re-heat (austenizing) between 830°C and 860°C followed by cooling in still air.
- Hardening - re-heat between 830°C and 860°C followed by quenching in oil.
- Tempering - generally between 550°C and 660°C.
- Where material is above the LRS for a specific heat treatment condition, only the surface hardness will be guaranteed and mechanical properties will be for information only.

Condition of delivery

- As-rolled or as-forged - hardness generally should not exceed 321HB, mechanical properties not guaranteed.
- Heat treated - to BS970:Part 1:1983 requirements or customer requirement as agreed between parties.
- Straightness shall not exceed 5mm over any 1000mm unless special straightness is required - not exceeding 2mm over any 1000mm.
- Sufficient material must be provided for to ensure all surface related defects are removed:
  - 2% of nominal diameter for rolled bar,
  - 4% of nominal diameter for forged bar from 90mm up to 220mm diameter,
  - 6% of nominal diameter for forged bar over 220mm up to 450mm diameter.

Typical uses

Dynamo and motor shafts, heat treated bolts and stus, crankshafts, connecting rods, driving rings and flanges, railway couplings, axles, brackets, housings and parts subjected to high stresses or wear, etc.

Size range in round bar and square bar offered

Max	Nominal diameter	Min	Calculated weight
(mm)	(mm)	(mm)	(kg/m)
16.3	16	15.7	1.578
20.3	20	19.7	2.466
22.3	22	21.7	2.984
24.3	24	23.7	3.551
25.3	25	24.7	3.853
27.3	27	26.7	4.494
28.3	28	27.7	4.833
30.45	30	29.55	5.549
32.45	32	31.55	6.313
35.45	35	34.55	7.552
36.45	36	35.55	7.990
38.45	38	37.55	8.902
40.6	40	39.4	9.864
42.6	42	41.4	10.875
45.6	45	44.4	12.484
48.6	48	47.4	14.204
50.6	50	49.4	15.413
53.6	53	52.4	17.317
55.8	55	54.2	18.649
60.8	60	59.2	22.194
63.8	63	62.2	24.469
66.2	65	63.8	26.047
71.2	70	68.8	30.209
76.2	75	68.8	34.678
81.57	80	78.43	39.456
86.57	85	83.43	44.542
91.5	90	88.5	49.937
96.5	95	93.5	55.639
101.5	100	98.5	61.650
104.5	103	101.5	65.404

Max	Nominal diameter	Min	Calculated weight
(mm)	(mm)	(mm)	(kg/m)
106.5	105	103.5	67.969
111.5	110	108.5	74.597
116.5	115	113.5	81.532
121.5	120	118.5	88.776
126.5	125	123.5	96.328
131.5	130	128.5	104.180
136.5	135	133.5	112.357
141.5	140	138.5	120.834
151.5	150	148.5	138.713
161.5	160	158.5	157.824
173	170	170	178.169
183	180	180	199.746
193	190	190	222.557
206	203	203	254.053
213	210	210	271.877
218	215	215	284.977
223	220	220	298.386
234	230	230	326.129
244	240	240	355.104
254	250	250	385.313
265	260	260	416.754
275	270	270	449.429
285	280	280	483.336
296	290	290	518.477
311	305	305	573.499
326	320	320	631.296
336	330	330	671.369
346	340	340	712.674
356	350	350	755.213
367	360	360	798.984

Max	Nominal diameter	Min	Calculated weight
(mm)	(mm)	(mm)	(kg/m)
377	370	370	843.989
387	380	380	890.226
407	400	400	986.400
433	425	425	113.553
458	450	450	1246.413
n/a	480	480	1420.416
n/a	500	500	1541.250
n/a	525	525	1699.228
n/a	550	550	1864.913

Square bar (round cornered)

Max	Nominal diameter	Min	Calculated weight
(mm)	(mm)	(mm)	(kg/m)
40.5	40	39.5	12.51
45.56	45	44.44	15.83
50.63	50	49.37	19.54
55.64	55	54.36	23.66
60.75	60	59.25	28.24
65.8	65	64.2	33.03
70.88	70	69.12	38.30
75.92	75	74.8	44.15
93.2	92.1	91	66.20
107	105	103	83.00
114.5	112.5	110.5	93.53