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Hardenability Bands for Carbon H Steels—SAE J776f

SAE Recommended Practice
Last Revised October 1977

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APPEAR IN THE 1979 EDITION
OF THE SAE HANDBOOK

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PREPRINT

HARDENABILITY BANDS FOR CARBON H STEELS—SAE J776f

SAE Recommended Practice

Report of Iron and Steel Technical Committee approved June 1961 and last revised October 1977.

[The SAE Iron and Steel Technical Committee established Division 8 in June 1960, to devise hardenability bands for carbon steels. The American Iron and Steel Institute contributed data on several grades of carbon steels and based on these data, bands for two grades of carbon steel were given the status of recommended practice rather than standard. Division 8 will continue to study these two grades and add other grades of carbon steel to the list as sufficient information becomes available.]

The hardenability bands for carbon steels reported in this SAE Recommended Practice are presented in the same manner used for alloy steels and reported in SAE J407. Pertinent sections of this standard are applicable for

methods of specifying either hardness limits or distances from quenched end. The bands are applicable to semifinished products for forging, to hot rolled and cold finished bars, to wire rods, and seamless tubing.

For carbon H steels distances from the quenched end may be specified in half-sixteenths (rather than sixteenths as with alloy steels). Use of sixteenths rather than thirty-seconds is continued in this recommended practice to avoid misunderstanding of units.

Hardenability tests should be performed in accordance with the section on Hardenability Test for Shallow Hardening Steels in SAE J406.

TABLE 1—CARBON AND CARBON BORON H STEELS COMPOSITION

SAE or AISI Steel No.	Chemical Composition, %				
	C	Mn	Si	P, max	S, max
1038H	0.34/0.43	0.50/1.00	0.15/0.30	0.040	0.050
1045H	0.42/0.51	0.50/1.00	0.15/0.30	0.040	0.050
1522H	0.17/0.25	1.00/1.50	0.15/0.30	0.040	0.050
1524H	1.25/1.75	1.25/1.75	0.15/0.30	0.040	0.050
1526H	0.21/0.30	1.00/1.50	0.15/0.30	0.040	0.050
1541H	0.35/0.45	1.25/1.75	0.15/0.30	0.040	0.050
15B21H ^a	0.17/0.24	0.70/1.20	0.15/0.30	0.040	0.050
15B35H ^a	0.31/0.39	0.70/1.20	0.15/0.30	0.040	0.050
15B37H ^a	0.30/0.39	1.00/1.50	0.15/0.30	0.040	0.050
15B62H ^a	0.54/0.67	1.00/1.50	0.40/0.60	0.040	0.050
15B41H ^b	0.35/0.45	1.25/1.75	0.15/0.30	0.040	0.050
15B48H ^b	0.43/0.53	1.00/1.50	0.15/0.30	0.040	0.050

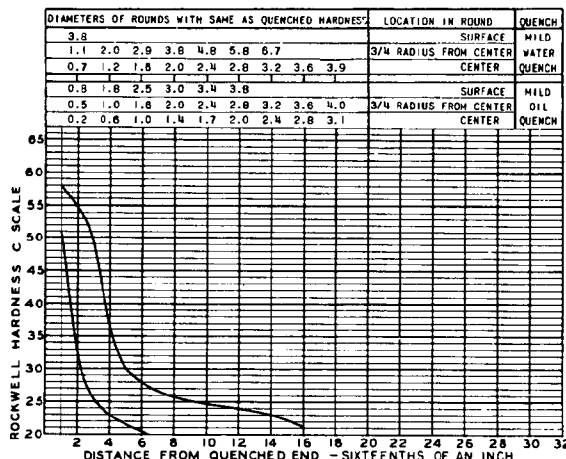
^a Boron—0.0005 min.

^b Boron—0.0005—0.003%.

HARDNESS LIMITS FOR SPECIFICATION PURPOSES		
*1/16" DISTANCE SIXTEENTHS OF AN INCH	MAX.	MIN.
1	58	51
1.5	56	42
2	55	34
2.5	53	29
3	49	26
3.5	43	24
4	37	23
4.5	33	22
5	30	22
5.5	29	21
6	28	21
6.5	27	20
7	27	-
7.5	26	-
8	26	-
9	25	-
10	25	-
12	24	-
14	23	-
16	21	-
HEAT TREATING TEMPERATURES RECOMMENDED BY SAE		
*NORMALIZE 1600 OF		
AUSTENITIZE 1550 OF		
*For forged or rolled specimens only.		

HARDENABILITY BAND 1038H

C	Mn	Si	Ni	Cr	Mo
0.34/0.43	0.50/1.00	0.15/0.30			



The ϕ symbol is for the convenience of the user in locating areas where technical revisions have been made to the previous issue of the report. If the symbol is next to the report title, it indicates a complete revision of the report.