

H Steel Composition Chart

This card lists the chemical composition limits of the carbon, carbon-boron and alloy H steels, the grades whose designation carries an H for hardenability. It is a reference summary of published data and it is not an Aobo Steel standard. Every cell is a ladle analysis range in weight percent.

Reference only. Aobo Steel supplies H steel bar and plate to order and does not carry out heat treatment. Verify the values below against the applicable standard and the material test certificate.

wt % ladle analysis **0.34/0.43** minimum / maximum limit **H** hardenability band guaranteed — not specified **B** boron treated, 0.0005-0.003 %

Carbon and carbon-boron H steels

The 1038H to 15BxxH series, where the H suffix means the hardenability band is guaranteed and not only the chemistry. Table 1 of the source.

SAE or AISI No.	UNS No.	C	Mn	Si	P, maximum	S, maximum
1038H	H10380	0.34/0.43	0.50/1.00	0.15/0.35	0.040	0.050
1045H	H10450	0.42/0.51	0.50/1.00	0.15/0.35	0.040	0.050
1522H	H15220	0.17/0.25	1.00/1.50	0.15/0.35	0.040	0.050
1524H	H15240	0.18/0.26	1.25/1.75	0.15/0.35	0.040	0.050
1526H	H15260	0.21/0.30	1.00/1.50	0.15/0.35	0.040	0.050
1541H	H15410	0.35/0.45	1.25/1.75	0.15/0.35	0.040	0.050
15B21H	H15211	0.17/0.24	0.70/1.20	0.15/0.35	0.040	0.050
15B28H	H15281	0.25/0.34	1.00/1.50	0.15/0.35	0.040	0.050
15B30H	H15301	0.27/0.35	0.70/1.20	0.15/0.35	0.040	0.050
15B35H	H15351	0.31/0.39	0.70/1.20	0.15/0.35	0.040	0.050
15B37H	H15371	0.30/0.39	1.00/1.50	0.15/0.35	0.040	0.050
15B41H	H15411	0.35/0.45	1.25/1.75	0.15/0.35	0.040	0.050
15B48H	H15481	0.43/0.53	1.00/1.50	0.15/0.35	0.040	0.050
15B62H	H15621	0.54/0.67	1.00/1.50	0.40/0.60	0.040	0.050

Source: ASM Handbook, Vol 1 (10th ed.), "Hardenable Carbon and Low-Alloy Steels", Table 1.

Standard alloy H steels

The 1330H to 94BxxH series. The same ranges apply only to material not exceeding $1.3 \times 10^5 \text{ mm}^2$ (200 in.²) in cross-sectional area, 460 mm (18 in.) in width, or 4.5 Mg (10,000 lb) per piece, as the source specifies. Table 2 of the source.

SAE or AISI No.	UNS No.	C	Mn	Si	Ni	Cr	Mo	V
1330H	H13300	0.27/0.33	1.45/2.05	0.15/0.35	—	—	—	—
1335H	H13350	0.32/0.38	1.45/2.05	0.15/0.35	—	—	—	—
1340H	H13400	0.37/0.44	1.45/2.05	0.15/0.35	—	—	—	—
1345H	H13450	0.42/0.49	1.45/2.05	0.15/0.35	—	—	—	—
4027H	H40270	0.24/0.30	0.60/1.00	0.15/0.35	—	—	0.20/0.30	—
4028H	H40280	0.24/0.30	0.60/1.00	0.15/0.35	—	—	0.20/0.30	—
4032H	H40320	0.29/0.35	0.60/1.00	0.15/0.35	—	—	0.20/0.30	—
4037H	H40370	0.34/0.41	0.60/1.00	0.15/0.35	—	—	0.20/0.30	—
4042H	H40420	0.39/0.46	0.60/1.00	0.15/0.35	—	—	0.20/0.30	—
4047H	H40470	0.44/0.51	0.60/1.00	0.15/0.35	—	—	0.20/0.30	—
4118H	H41180	0.17/0.23	0.60/1.00	0.15/0.35	—	0.30/0.70	0.08/0.15	—
4130H	H41300	0.27/0.33	0.30/0.70	0.15/0.35	—	0.75/1.20	0.15/0.25	—
4135H	H41350	0.32/0.38	0.60/1.00	0.15/0.35	—	0.75/1.20	0.15/0.25	—
4137H	H41370	0.34/0.41	0.60/1.00	0.15/0.35	—	0.75/1.20	0.15/0.25	—
4140H	H41400	0.37/0.44	0.65/1.10	0.15/0.35	—	0.75/1.20	0.15/0.25	—
4142H	H41420	0.39/0.46	0.65/1.10	0.15/0.35	—	0.75/1.20	0.15/0.25	—
4145H	H41450	0.42/0.49	0.65/1.10	0.15/0.35	—	0.75/1.20	0.15/0.25	—
4147H	H41470	0.44/0.51	0.65/1.10	0.15/0.35	—	0.75/1.20	0.15/0.25	—
4150H	H41500	0.47/0.54	0.65/1.10	0.15/0.35	—	0.75/1.20	0.15/0.25	—
4161H	H41610	0.55/0.65	0.65/1.10	0.15/0.35	—	0.65/0.95	0.25/0.35	—
4320H	H43200	0.17/0.23	0.40/0.70	0.15/0.35	1.55/2.00	0.35/0.65	0.20/0.30	—
4340H	H43400	0.37/0.44	0.55/0.90	0.15/0.35	1.55/2.00	0.65/0.95	0.20/0.30	—
E4340H	H43406	0.37/0.44	0.60/0.95	0.15/0.35	1.55/2.00	0.65/0.95	0.20/0.30	—
4620H	H46200	0.17/0.23	0.35/0.75	0.15/0.35	1.55/2.00	—	0.20/0.30	—
4718H	H47180	0.15/0.21	0.60/0.95	0.15/0.35	0.85/1.25	0.30/0.60	0.30/0.40	—
4720H	H47200	0.17/0.23	0.45/0.75	0.15/0.35	0.85/1.25	0.30/0.60	0.15/0.25	—
4815H	H48150	0.12/0.18	0.30/0.70	0.15/0.35	3.20/3.80	—	0.20/0.30	—
4817H	H48170	0.14/0.20	0.30/0.70	0.15/0.35	3.20/3.80	—	0.20/0.30	—
4820H	H48200	0.17/0.23	0.40/0.80	0.15/0.35	3.20/3.80	—	0.20/0.30	—
50B40H	H50401	0.37/0.44	0.65/1.10	0.15/0.35	—	0.30/0.70	—	—
50B44H	H50441	0.42/0.49	0.65/1.10	0.15/0.35	—	0.30/0.70	—	—

H Steel Composition Reference · Aobo Steel

SAE or AISI No.	UNS No.	C	Mn	Si	Ni	Cr	Mo	V
5046H	H50460	0.43/0.50	0.65/1.10	0.15/0.35	—	0.13/0.43	—	—
50B46H	H50461	0.43/0.50	0.65/1.10	0.15/0.35	—	0.13/0.43	—	—
50B50H	H50501	0.47/0.54	0.65/1.10	0.15/0.35	—	0.30/0.70	—	—
50B60H	H50601	0.55/0.65	0.65/1.10	0.15/0.35	—	0.30/0.70	—	—
5120H	H51200	0.17/0.23	0.60/1.00	0.15/0.35	—	0.60/1.00	—	—
5130H	H51300	0.27/0.33	0.60/1.10	0.15/0.35	—	0.75/1.20	—	—
5132H	H51320	0.29/0.35	0.50/0.90	0.15/0.35	—	0.65/1.10	—	—
5135H	H51350	0.32/0.38	0.50/0.90	0.15/0.35	—	0.70/1.15	—	—
5140H	H51400	0.37/0.44	0.60/1.00	0.15/0.35	—	0.60/1.00	—	—
5147H	H51470	0.45/0.52	0.60/1.05	0.15/0.35	—	0.80/1.25	—	—
5150H	H51500	0.47/0.54	0.60/1.00	0.15/0.35	—	0.60/1.00	—	—
5155H	H51550	0.50/0.60	0.60/1.00	0.15/0.35	—	0.60/1.00	—	—
5160H	H51600	0.55/0.65	0.65/1.10	0.15/0.35	—	0.60/1.00	—	—
51B60H	H51601	0.55/0.65	0.65/1.10	0.15/0.35	—	0.60/1.00	—	—
6118H	H61180	0.15/0.21	0.40/0.80	0.15/0.35	—	0.40/0.80	—	0.10/0.15
6150H	H61500	0.47/0.54	0.60/1.00	0.15/0.35	—	0.75/1.20	—	0.15
81B45H	H81451	0.42/0.49	0.70/1.05	0.15/0.35	0.15/0.45	0.30/0.60	0.08/0.15	—
8617H	H86170	0.14/0.20	0.60/0.95	0.15/0.35	0.35/0.75	0.35/0.65	0.15/0.25	—
8620H	H86200	0.17/0.23	0.60/0.95	0.15/0.35	0.35/0.75	0.35/0.65	0.15/0.25	—
8622H	H86220	0.19/0.25	0.60/0.95	0.15/0.35	0.35/0.75	0.35/0.65	0.15/0.25	—
8625H	H86250	0.22/0.28	0.60/0.95	0.15/0.35	0.35/0.75	0.35/0.65	0.15/0.25	—
8627H	H86270	0.24/0.30	0.60/0.95	0.15/0.35	0.35/0.75	0.35/0.65	0.15/0.25	—
8630H	H86300	0.27/0.33	0.60/0.95	0.15/0.35	0.35/0.75	0.35/0.65	0.15/0.25	—
86B30H	H86301	0.27/0.33	0.60/0.95	0.15/0.35	0.35/0.75	0.35/0.65	0.15/0.25	—
8637H	H86370	0.34/0.41	0.70/1.05	0.15/0.35	0.35/0.75	0.35/0.65	0.15/0.25	—
8640H	H86400	0.37/0.44	0.70/1.05	0.15/0.35	0.35/0.75	0.35/0.65	0.15/0.25	—
8642H	H86420	0.39/0.46	0.70/1.05	0.15/0.35	0.35/0.75	0.35/0.65	0.15/0.25	—
8645H	H86450	0.42/0.49	0.70/1.05	0.15/0.35	0.35/0.75	0.35/0.65	0.15/0.25	—
86B45H	H86451	0.42/0.49	0.70/1.05	0.15/0.35	0.35/0.75	0.35/0.65	0.15/0.25	—
8650H	H86500	0.47/0.54	0.70/1.05	0.15/0.35	0.35/0.75	0.35/0.65	0.15/0.25	—
8655H	H86550	0.50/0.60	0.70/1.05	0.15/0.35	0.35/0.75	0.35/0.65	0.15/0.25	—
8660H	H86600	0.55/0.65	0.70/1.05	0.15/0.35	0.35/0.75	0.35/0.65	0.15/0.25	—
8720H	H87200	0.17/0.23	0.60/0.95	0.15/0.35	0.35/0.75	0.35/0.65	0.20/0.30	—
8740H	H87400	0.37/0.44	0.70/1.05	0.15/0.35	0.35/0.75	0.35/0.65	0.20/0.30	—
8822H	H88220	0.19/0.25	0.70/1.05	0.15/0.35	0.35/0.75	0.35/0.65	0.30/0.40	—
9260H	H92600	0.55/0.65	0.65/1.10	1.70/2.20	—	—	—	—
9310H	H93100	0.07/0.13	0.40/0.70	0.15/0.35	2.95/3.55	1.00/1.45	0.08/0.15	—
94B15H	H94151	0.12/0.18	0.70/1.05	0.15/0.35	0.25/0.65	0.25/0.55	0.08/0.15	—
94B17H	H94171	0.14/0.20	0.70/1.05	0.15/0.35	0.25/0.65	0.25/0.55	0.08/0.15	—
94B30H	H94301	0.27/0.33	0.70/1.05	0.15/0.35	0.25/0.65	0.25/0.55	0.08/0.15	—

Source: ASM Handbook, Vol 1 (10th ed.), "Hardenable Carbon and Low-Alloy Steels", Table 2.

Table notes

- One grade label in the source table is printed with a digit where the letter H belongs. Grade 81B45H is printed as 81B4S5 in the source and is given here as 81B45H, because the H suffix is what makes the grade an H steel and 81B45 is the base grade it is derived from. An H grade is not interchangeable with the same number without the H. Both have the same nominal chemistry, but only the H grade carries a hardenability band that the mill guarantees by end-quench test. A part designed around the band needs the H grade, and a certificate for the plain grade will not show the hardenability result.
- Composition data is for general reference only. Actual values vary by standard, mill, and heat number. Confirm against the material test certificate (MTC) or contact Aobo Steel.
- The two limits printed in each cell are the minimum and the maximum of the ladle analysis range, written with a slash. The range is wider than the same grade without the H suffix because the mill is allowed to move inside it to hit the hardenability band.

Aobo Steel, tool steel supplier

Aobo Steel supplies forged tool steel and free-cutting engineering steels from Huangshi, Hubei, China, where the local supply chain covers ESR melting, vacuum degassing and LF refining, forging, hot rolling, turned and peeled bar, heat treatment and third party inspection. We have worked in steel since 2003 and supply to order in cold work grades such as D2, D3 and O1, hot work grades such as H10 and H13, stainless grades 420, 440C and 4Cr13, and carbon and alloy bar.

Reference data compiled from ASM Handbook, Vol 1 (10th ed.), Hardenable Carbon and Low-Alloy Steels, Tables 1 and 2, and from the Aobo Steel H steel composition chart.

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