

ENGINEERING SPECIFICATION

Hyster-Yale Group, Inc. Title: MEDIUM CARBON STEEL BAR STOCK		Document Control Number: HC-4	
Page 1 of 1	Document Author: Caitlin Toohey	Effective Date: 01-Mar-2017	Revision No. 2017-03

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I. OBJECTIVE

This specification is established to provide a general purpose medium carbon steel material suitable for case or through hardening with minimum as-rolled yield strength of approximately 45,000 psi (310 MPa).

For cylinder rods, use HC-114 for new designs.

II. CITED

See Master Index or attached Appendix for a complete list of Citing & Cited Documents.

III. REQUIREMENTSStandard Grade

SAE/AISI C-1045

Chemical Composition, % Ladle Analysis (Similar to AISI/SAE 1045)

Carbon	0.40 – 0.50
Manganese	0.60 – 0.90
Silicon	0.15 – 0.30
Phosphorous	0.04 maximum
Sulfur	0.05 maximum

Alternate Specifications

Chinese: Grade 45 per GB/T 699-1999

Japanese: Grade S45C per JIS G4051

European: Grade C45 per EN 10083-2006

Quality

Special Fully Killed - Fine grain practice as determined by ASTM E112

Condition

Hot rolled - As rolled

Dimensional Tolerances

As stated within ASTM A29/A29M

Certification

The supplier shall include with each material or subcontracted part lot shipped to Hyster-Yale Group a statement certifying compliance with HC-4 requirements signed by an authorized representative of the supplier.

AnnexCited Documents

ASTM A29/A29M	General requirements for hot rolled and cold formed steel bars
BS 970 P1	Wrought steels for mechanical and allied engineering purposes Grade 080M50