

ENGINEERING MATERIAL SPECIFICATION

Material Name

Specification Number

STEEL, 130,000 PSI (896 MPa) YIELD STRENGTH – SAE 4140

ESW-M1A125-B

1. SCOPE

The material defined by this specification is a chromium molybdenum alloy steel, having sufficient carbon content to attain a minimum yield strength of 130,000 psi (896 MPa) following special steel mill treatment.

2. APPLICATION

This specification was released originally for materials used for shafting material in which fatigue resistance is desired and design requirements are within the mechanical strength limitations defined below.

3. REQUIREMENTS

3.1 STANDARD REQUIREMENTS FOR PRODUCTION MATERIALS

Material suppliers and part producers must conform to the Company's Standard Requirements For Production Materials (WSS-M99P1111-A).

3.2 MECHANICAL PROPERTIES (ASTM E 8 and ASTM E 18)

3.2.1	Tensile Strength, min	150,000 psi (1030 MPa)
3.2.2	Yield Strength, min	130,000 psi (896 MPa)
3.2.3	Proof Stress, min (0.01% Offset - 1-1/2 in (38 mm) Dia. and Smaller)	120,000 psi (827 MPa)
3.2.4	Elongation	10 - 20%
3.2.5	Reduction of Area	30 - 45%
3.2.6	Hardness, Rockwell "C"	32 - 38

Date	Action	Revisions
2002 07 31	Revised	Updated and renumbered
1979 01 10		Metricated and Retyped CAH2 823385
1964 07 14		Released CR16-113900-52

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3.3 CHEMICAL COMPOSITION

Carbon	0.40 - 0.53
Manganese	0.75 - 1.00
Phosphorus	0.04 max
Sulphur	0.04 max
Silicon	0.20 - 0.35
Chromium	0.80 - 1.10
Molybdenum	0.15 - 0.25

3.4 QUALITY

The material shall be free of all internal defects which would adversely affect mechanical properties. Surface defects such as seams, non-metallic inclusions, voids, pits, and decarburization shall not exceed 0.010 in (0.25 mm) in depth in bars up to 5/8 in (16 mm) diameter inclusive. In bars of greater than 5/8 in (16 mm) diameter, the commercial quality tolerance for depth of the above defect shall be 0.001 in (0.03 mm) per each 1/16 in (1.6 mm) of bar diameter.