



ENGINEERING MATERIAL SPECIFICATION

Material Name

Specification Number

STEEL, CHROMIUM VANADIUM ALLOYED

SQ-M1A9461-A20H

1. SCOPE

The material defined by this specification is a chromium-vanadium alloyed high grade structural steel.

2. APPLICATION

This specification was released originally for material used for manufacturing transmission gears, which are case-hardened after machining.

3. REQUIREMENTS

3.1 ANALYSIS, %

C	0,17 - 0,23
Si	0,20 - 0,35
Mn	0,60 - 1,00
P	max 0,040
S	max 0,040
Cr	0,60 - 1,00
V	min 0,10
Mo	0,02 - 0,08
Ni	0,08 - 0,25
or	
Sum of Ni + Mo	0,12 - 0,30

(Checking according to SAE J408c; permissible variations according to SAE J409 b).

3.2 HARDENABILITY

Must conform to the hardenability band given in figure 1.

(Checking according to SAE J 406 a).

3.3 AUSTENITE GRAIN SIZE

5 - 8 with
max 20 % 4

(Checking according to SAE J 418 a).

3.4 DEGREE OF PURITY

3.4.1 DEGREE OF PURITY, MACROSCOPIC

Must conform to Ford Specification SQ-M99P9000-A.

Date	Release No.	Release/Revision
1992 01 31	C10176261	Revised and Retyped. Was 4 sheets.
1984 02 16	B/701887TP	Revised
1981 05 15	SM/EQ8778TP	Released

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3.4 DEGREE OF PURITY (continued)

3.4.2 DEGREE OF PURITY, MICROSCOPIC

Must conform to Ford Specification SQ-M99P9001-A.

3.5 STATISTICAL PROCESS

Suppliers must conform to the requirements of Ford Quality System Standard Q-101. A mutually acceptable Control Plan as described therein is required for material/source approval. Appropriate statistical tools must be used to analyze process/product data so that variation in the final product is continuously reduced.

3.6 SUPPLIERS RESPONSIBILITY

All materials supplied to this specification must be equivalent in all characteristics to the material upon which approval was originally granted.

Prior to making any change in the properties, composition, construction, colour, processing or labelling of the material originally approved under this specification, whether or not such changes affect the material's ability to meet the specification requirements, the Supplier shall notify Purchasing, Toxicology and the affected Materials Engineering activity of the proposed changes and obtain the written approval of the Materials Engineering activity. Test data, test samples and a new code identification are to be submitted with the request.

Substance restrictions imposed by law, regulations or Ford, apply to the materials addressed by this document. The restrictions are defined in Engineering Material Specification WSS-M99P9999-A1, unless a different suffix (e.g. A2 or A3) is specified on the engineering document for the application.

4. APPROVAL OF MATERIALS

Materials defined by this specification must have prior approval by the responsible Materials Engineering activity. Suppliers desiring approval of their materials shall first obtain an expression of interest from the affected Purchasing, Design and Materials Engineering activity. Upon request, the Supplier shall submit to the affected Materials Engineering activity a completed copy of their laboratory test reports, signed by a qualified and authorised representative of the test facility, demonstrating full compliance with all the requirements of this specification (test results, not nominal values), the material designation and code number, and test specimens for Ford evaluation. Ford's engineering approval of a material will be based on its performance to this specification and on an assessment of suitability for intended processes and/or applications. Upon approval, the material will be added to the Engineering Material Approved Source List.