AERONAUTICAL MATERIAL SPECIFICATION

Society of Automotive Engineers, Inc.
29 West 39th Street
New York City

AMS6323A

Issued 11-1-44
Revised 7-1-47

STEEL TUBING - SEAMLESS (MECHANICAL)
.55Ni-.5Cr-.25Mo (.38-.43C)

1. ACKNOWLEDGMENT: A vendor shall mention this specification number and its revision letter in all quotations and when acknowledging purchase orders.

2. FORM: Heavy wall tubing for machining.

3. APPLICATION: Parts with wall thickness 0.375 in. or less which require a through-hardening steel capable of developing hardness of Rockwell C50 when properly hardened and tempered and also parts of greater wall thickness but requiring proportionately lower hardness.

4. COMPOSITION:

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		Check Analysis Under Min or Over Max	
Carbon	0.38 - 0.43	0.02	0.02
Manganese	0.75 - 1.00	0.04	0.04
Silicon	0.20 - 0.35	0.02	0.02
Phosphorus	0.040 max	--	0.005
Sulfur	0.040 max	--	0.005
Chromium	0.40 - 0.60	0.03	0.03
Nickel	0.40 - 0.70	0.03	0.03
Molybdenum	0.20 - 0.30	0.02	0.02

5. CONDITION: Unless otherwise specified, tubing shall be supplied cold finished in a machinable condition with hardness not higher than Rockwell C25. If hot finished tubing is ordered, it shall be supplied in a machinable condition with hardness not higher than Rockwell B99.

6. HARDENABILITY: The hardenability shall be J50=5 min and J45=8 min when determined by the standard end-quench test specimen in accordance with the SAE Method of Determining Hardenability published in the latest issue of the SAE Handbook, except that the steel shall be normalized at 1700 F ± 10 and the test specimen austenitized at 1500 F ± 10. The hardenability test is not required on tubing which will not yield a suitable specimen but the steel from which the tubing is made shall conform to the hardenability specified in this section.

7. GRAIN SIZE: Five or finer as determined on the billet, ASTM E19-46, method a, unless otherwise ordered. A heat of steel predominantly five or finer with grains as large as three is permissible.

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8. DECARBURIZATION: (a) Tubing ordered ground or turned shall be free from outside decarburization and the inside decarburization shall not exceed the maximum depth specified in (c) below.

(b) Allowable decarburization of pierced billets, or of tubing for redrawing, or of tubing ordered to specified microstructural requirements, shall be as agreed between purchaser and vendor.

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