AERONAUTICAL MATERIAL SPECIFICATION

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

AMS 4070A

Issued 10-15-40
Revised 12-1-42

ALUMINUM ALLOY TUBING
Magnesium Chromium (52S-0)

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

2. COMPOSITION:

Magnesium	2.2 - 2.8
Chromium	0.15 - 0.35
Iron plus Silicon	0.45 max
Manganese	0.10 max
Copper	0.10 max
Zinc	0.10 max
Other Impurities, each	0.05 max
Other Impurities, total	0.15 max
Aluminum	remainder

3. CONDITION: (a) Annealed, unless otherwise specified, conforming to the following physical properties, when tested:

Tensile Strength, lb per sq in.	35,000 max
Yield Strength (0.2% Set), lb per sq in.	20,000 max
Equivalent Extension Under Load, inch in 2 in.	0.0079

(b) The tubing shall be capable of being flattened sidewise under a gradually applied load, without cracking, into an oval shape until the minimum outside dimension is three times the wall thickness.

(c) The tubing shall be capable of being flared sufficiently for use in standard compression type fittings using usual shop equipment and practices.

(d) Unless otherwise specified, the manufacturer shall apply an air pressure of 250 pounds per square inch to the inside of each tube 1-1/2 inches or less in diameter, for a period of not less than 5 seconds, while the tube is immersed in water or other suitable liquid. The pressure test may be applied to the tube after reduction to size but before the final anneal. Any tube which leaks, as indicated by the formation of air bubbles in the liquid, shall be rejected.

4. QUALITY: The material shall be seamless, uniform in quality and temper, commercially straight, clean, smooth, and free from seams, laminations, blisters, and other injurious defects, within the limits of best commercial manufacturing methods. Material revealing defects during fabrication is subject to rejection.

5. TOLERANCES: (a) Diameter.- The outside diameter of the tubing at any section shall not vary from the nominal diameter by more than the following tolerances, all dimensions are in inches:

Nominal Outside Diameter	Tolerance, plus or minus Mean Diameter Measurement
3/8 to 1/2, incl.	0.003
Over 1/2 to 1 "	0.004
" 1 to 2 "	0.005
" 2 to 3 "	0.006
" 3 to 5 "	0.008
" 5 to 6 "	0.010
" 6 to 8 "	0.015
" 8 to 10 "	0.020
" 10 to 12 "	0.025

NOTES: (a) The tubing shall be commercially round.

(b) If so specified in the purchase order the tolerances for outside diameter shall apply to the inside diameter instead, but not to both inside and outside diameter of the same lot of tubing.

(b) Wall Thickness.- Individual readings for the various nominal wall thicknesses shall not vary more than the following:

NOMINAL	INDIVIDUAL READINGS Min	Max	NOMINAL	INDIVIDUAL READINGS Min	Max
0.022	0.020	0.025	0.109	0.098	0.120
0.025	0.023	0.028	0.120	0.108	0.132
0.028	0.025	0.031	0.134	0.120	0.148
0.032	0.029	0.036	0.148	0.133	0.163
0.035	0.032	0.039	0.165	0.148	0.182
0.042	0.038	0.047	0.180	0.162	0.198
0.049	0.044	0.054	0.203	0.182	0.223
0.058	0.052	0.064	0.220	0.198	0.242
0.065	0.059	0.072	0.238	0.214	0.262
0.072	0.065	0.080	0.259	0.233	0.285
0.083	0.075	0.092	0.284	0.255	0.312
0.095	0.085	0.105	0.300	0.270	0.330

(c) Straightness.- Tubing in diameters 3/8" and greater shall be straight within a tolerance of 0.1" in 10' or one part in twelve hundred parts of length. Smaller tubing shall be substantially free from kinks and sharp bends and shall be commercially straight. Tubing shall be cut square within a tolerance of 1/64" per inch of diameter or fraction thereof.

6. REPORTS: The manufacturer shall furnish three copies of a notarized report stating that the physical properties and chemical composition of the material are within the requirements specified. This report shall include the purchase order number, material specification number, size, quantity, and part number if parts are supplied.