

Aircraft Material Specification

**ALUMINIUM-COPPER-NICKEL-MAGNESIUM-IRON-SILICON ALLOY
CRANKCASE FORGINGS**

(Special heat treatment)

NOTE.—This specification is one of a series issued by the Ministry of Supply, either to meet a limited requirement not covered by any existing British Standard or to serve as a basis for inspection of materials the properties and uses of which are not sufficiently developed to warrant submission to the British Standards Institution for standardisation.

- A. Cast ingots, billets and slabs for hot working.
- B. Extruded or rolled bars and billets for forging.
- E. Forgings.

1. Inspection and testing procedure

1.1. This specification shall be used in conjunction with the relevant sections of British Standard L.100 as follows :—

- A. Cast ingots, billets and slabs for hot working .. Sections One and Two
- B. Extruded or rolled bars and billets for forging .. Sections One and Three
- E. Forgings Sections One and Seven

2. Quality of material

2.1. The material shall be made from aluminium complying with the requirements of British Standards L.31, L.48 or L.49, aluminium alloy ingots complying with British Standard L.50, and alloying constituents, with or without approved scrap, at the discretion of the manufacturer.

3. Chemical composition

3.1. The chemical composition of the material shall be :

Copper	not less than 1.8 and not more than 2.5 per cent.
Magnesium	not less than 0.65 and not more than 1.2 per cent.
Silicon	not less than 0.55 and not more than 1.25 per cent.
Iron	not less than 0.60 and not more than 1.2 per cent.
*Manganese	not more than 0.2 per cent.
Nickel	not less than 0.6 and not more than 1.4 per cent.
*Zinc	not more than 0.2 per cent.
*Lead	not more than 0.05 per cent.
*Tin	not more than 0.05 per cent.
Titanium	not less than 0.05 and not more than 0.15 per cent.
Aluminium	the remainder.

* Subject to the discretion of the Inspecting Authority, determination of these elements need be made on a small proportion only of the samples analysed.

4. Condition

- 4.1. Cast ingots, billets and slabs and extruded or rolled bars and billets shall be supplied in the non-heat-treated condition.
- 4.2. Forgings shall be supplied in the heat-treated condition.

5. Heat treatment

5.1. Forgings and test samples shall be heat treated as follows :—
Heat treat at 530° ± 5°C. for 2 hours and cool in air, then heat treat at 200° ± 5°C. for 2 to 5 hours.

6. Mechanical properties

6.1. The mechanical properties obtained from test pieces selected and prepared as stated in the appropriate clauses of British Standard L.100 shall be as follows :—

6.2. *Tensile test*

0.1 per cent. proof stress	not less than 7.0 tons/sq. in.
Ultimate tensile stress	not less than 16.0 tons/sq. in.
Elongation	not less than 16 per cent.

6.3. *Hardness test*

A hardness test shall be carried out on each forging within seven days of heat treatment. The Brinell hardness number shall be not more than 85.

Approved for issue

H. SUTTON,

Director of Materials Research and Development (Air).

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