

REPRODUCED BY THE STANDARDS ASSOCIATION OF AUSTRALIA BY PERMISSION OF THE BRITISH AIR MINISTRY AND HIS MAJESTY'S STATIONERY OFFICE.

**AIR MINISTRY**  
*Crown Copyright Reserved*

Inspector-in-Charge A.I.D.  
Commercial Steels & Forge Pty. Ltd.  
Lidcombe.

**D.T.D. 88 B**

*(Superseding Specification  
No. D.T.D. 88A)*

*December, 1934*

**Material Specification**

**MAGNESIUM ALLOY FORGINGS, INCLUDING STAMPINGS  
AND PRESSINGS**

**(Not suitable for pistons)**

**MINISTRY OF SUPPLY**

*Crown Copyright Reserved*

**D.T.D. 88C**

*Amendment No. 1  
May, 1957*

**Aircraft Material Specification**

**MAGNESIUM—ALUMINIUM—ZINC ALLOY FORGINGS AND PRESSINGS**

**Clause 2. Chemical Composition.**

**Clauses 2.1 and 2.2**

*Delete*

Copper.....not more than 0.03 per cent  
Silicon .....not more than 0.05 per cent

*Insert*

Copper.....not more than 0.1 per cent  
Silicon .....not more than 0.1 per cent

**LONDON**

**HER MAJESTY'S STATIONERY OFFICE**

Price 2d. net

(18.6.57) (S.O.1283) Wt.3649-2067 K8 8/57 M. H. & S, Ltd. G.345

70-9999

**3. Heat Treatment.**—The forgings may be supplied "as forged" or "as forged and annealed".

**4. Selection and Preparation of Mechanical Test Samples.**—(a) The test samples shall be from the same cast as the forgings they represent and shall be forged and/or machined to the ruling thickness of the forgings, provided always that no test sample shall be greater than 3 inches in diameter or thickness.

(b) The forgings from the same cast (if heat treated, those heat treated together) shall be grouped in parcels as follows:—

Weight of Forging.	Parcel.
2 lb. and under	2 cwt.
Over 2 lb. and up to 7 lb.	100 forgings.
Over 7 lb. and up to 20 lb.	40 forgings.
Over 20 lb. and up to 40 lb.	20 forgings.
Over 40 lb. and up to 200 lb.	5 forgings.
Over 200 lb.	1 forging.

Price 1s. 3d. (Australian Currency).

REPRODUCED BY THE STANDARDS ASSOCIATION OF AUSTRALIA BY PERMISSION OF THE BRITISH AIR MINISTRY AND HIS MAJESTY'S STATIONERY OFFICE.

**AIR MINISTRY**

*Crown Copyright Reserved*

Inspector-in-Charge A.I.D.  
Commercial Steels & Forge Pty. Ltd.  
Lidcombe.

**D.T.D. 88 B**

*(Superseding Specification  
No. D.T.D. 88A)*

*December, 1934*

**Material Specification**

**MAGNESIUM ALLOY FORGINGS, INCLUDING STAMPINGS  
AND PRESSINGS**

**(Not suitable for pistons)**

*NOTE.—This specification is one of a series issued by the Air Ministry either to meet a limited requirement, not covered by any existing British Standard Specification 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.*

The specific gravity of this alloy is 1.82.

**1. Chemical Composition.**—(a) The chemical composition of the alloy shall be:—

Aluminium	..	..	..	not more than 11.0 per cent.
Zinc	..	..	..	not more than 1.5 per cent.
Manganese	..	..	..	not more than 1.0 per cent.
Total impurities	..	..	..	not more than 1.5 per cent.
Magnesium	..	..	..	the remainder.

(b) Unless otherwise agreed with the Director of Aeronautical Inspection, the complete analysis of every cast shall be supplied to the inspector.

**2. Freedom from Defects.**—(a) The forgings shall be free from defects.

(b) Any forgings may be rejected for faults in manufacture notwithstanding that they have been passed previously on chemical composition and mechanical tests.

**3. Heat Treatment.**—The forgings may be supplied "as forged" or "as forged and annealed".

**4. Selection and Preparation of Mechanical Test Samples.**—(a) The test samples shall be from the same cast as the forgings they represent and shall be forged and/or machined to the ruling thickness of the forgings, provided always that no test sample shall be greater than 3 inches in diameter or thickness.

(b) The forgings from the same cast (if heat treated, those heat treated together) shall be grouped in parcels as follows:—

Weight of Forging.	Parcel.
2 lb. and under	2 cwt.
Over 2 lb. and up to 7 lb.	100 forgings.
Over 7 lb. and up to 20 lb.	40 forgings.
Over 20 lb. and up to 40 lb.	20 forgings.
Over 40 lb. and up to 200 lb.	5 forgings.
Over 200 lb.	1 forging.

The inspector shall select one test sample to represent each parcel for mechanical testing and the test samples shall not be further heat treated or mechanically worked before testing.

(c) If the forgings are heat treated, the test samples and forgings shall be heat treated together.

(d) The test samples shall be marked as directed by the inspector before they are removed from the bars or billets.

(e) For test samples up to and including  $1\frac{1}{8}$  inches diameter or width across flats, the tensile test piece shall be machined concentrically from the test sample.

For test samples over  $1\frac{1}{8}$  inches diameter or width across flats, the longitudinal axis of the tensile test piece shall be not less than  $\frac{9}{16}$  inch from the surface of the test sample.

The tensile test pieces shall be turned to the dimensions of the British Standard Test Piece C (a suitable test piece is shown in Fig. 1) or if the samples are too small, turned to a similar form having the same geometrical proportions.

(f) A small flat shall be prepared on the shoulder of each tensile test piece for the hardness test specified in clause 6.

**5. Tensile Test.**—(a) The mechanical properties of the test pieces machined from the samples selected and prepared as specified in clause 4 must comply with the following tests to the satisfaction of the inspector.

0·1 per cent. Proof Stress not less than 8 tons per sq. inch.

Ultimate Tensile Stress not less than 15 tons per sq. inch.

Elongation not less than 5 per cent.

The testing appliances shall be such that the load when applied is axial.

Should a tensile test piece break outside the middle half of its gauge length, the test may be discarded and another test made.

(b) If any test piece fails to comply with the tests specified in paragraph (a) above, the inspector may reject the parcel represented by that test piece, or, at the request of the manufacturer, select for test two other samples from the same parcel. Test pieces prepared from these two further samples as specified in clause 4 must comply with the tensile test specified in paragraph (a) above.

Failing the provision of the necessary test samples to permit of the re-tests called for above, the re-tests may be made on test samples cut from actual forgings selected by the inspector.

**6. Hardness Test.**—(a) A hardness test shall be carried out by an approved method on the tensile test piece and on at least 10 per cent. of the forgings in each parcel specified in clause 4. The hardness test on both test pieces and forgings must be carried out under identical conditions.

The mean hardness number of each forging tested must not be more than 10 per cent. lower than that given by the tensile test piece.

(b) If any forging fails to comply with the hardness test specified in paragraph (a) above, all the forgings in the parcel represented must be submitted to the hardness test.

The forgings which fail to comply with the hardness test may be rejected by the inspector or, at the request of the manufacturer, re-tested in accordance with clauses 4, 5 and 6.

**7. Identification.**—(a) Forgings under 5 lb. All forgings under 5 lb. each in weight, passed by the inspector, shall be made into parcels which shall bear a tag stamped with the mark of the inspector and such other marking as shall ensure full identification of the material.

(b) Forgings 5 lb. and over. All forgings 5 lb. in weight and over, passed by the inspector, shall be stamped with the mark of the inspector and such other marking as shall ensure full identification of the material. All stamping must be done wherever it is least liable to be detrimental to the forging.

The ends to be shaped to fit the axial loading shackles of the testing machine.

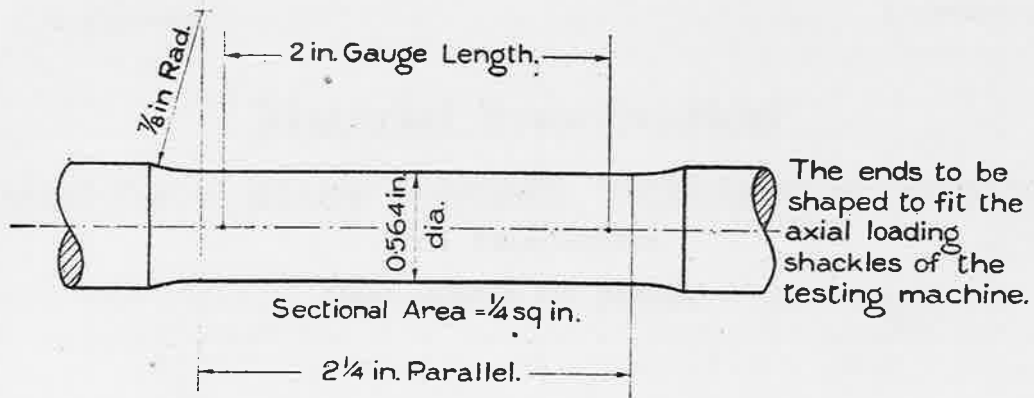


Fig. 1.—Tensile test piece.