

COMMONWEALTH AIRCRAFT CORPORATION PTY. LTD.

Date of Issue—March, 1942.

Specification No.

Revised Date—June, 1942.

C.A. 109 A.

Specification for

BRIGHT DRAWN FREE MACHINING STEEL BARS

1. DESCRIPTION.

This specification covers one grade of Free Machining Steel Bar for use in aircraft.

2. CHEMICAL COMPOSITION.

The chemical composition of the material shall be:—

Carbon	-	-	-	0.20 per cent. (maximum)
Manganese	-	-	-	1.2 to 1.65 per cent.
Silicon	-	-	-	0.30 per cent. (maximum)
Sulphur	-	-	-	0.20 to 0.30 per cent.
Phosphorous	-	-	-	0.06 per cent. (maximum)

3. CONDITION.

The bars shall be delivered in the bright drawn condition. They may, however, at the option of the manufacturer, be re-heat treated after cold working to a temperature not exceeding 620° C. Any heat treatment must be carried out without forming on the bars a scale of measurable thickness.

4. FREEDOM FROM DEFECTS.

- (a) The bars shall be straight and free from any surface defects.
- (b) Any bar may be rejected for faults in manufacture, notwithstanding that it may have been previously passed for chemical composition and mechanical tests.

5. DIMENSIONS.

Margins of manufacture, when required, shall be specified on the order.

6. IDENTIFICATION.

- (a) When specified on the order each Bar shall be colour identified in accordance with the provisions of Australian Standard No. (E) D 500.
- (b) All bars under one inch diameter shall be wired in bundles, which shall bear a metal tag stamped in such a way as shall ensure full identification of the material with its particular cast and with the manufacturer.
- (c) All bars one inch and over on any sectional dimensions shall be marked at each end in such a way as shall ensure full identification of the material with its particular cast and with the manufacturer.
- (d) In addition to the information required in (b) and (c) above, the tag, bars or billets shall be marked "CA. 109."

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7. SELECTION AND PREPARATION OF TEST SAMPLES.

- (a) Bars and billets of each size from the same cast shall be grouped in parcels of not more than two tons weight.
- (b) One test sample shall be selected from one bar in each 100 bars.
- (c) Tensile test pieces shall be prepared from the samples to the dimensions shown in B.S. Specification A4 or Commonwealth Aircraft Corporation Pty. Ltd. Specification CA. 701.
- (d) Should any tensile test piece break outside the middle half of the gauge length the test may be discarded and another test made.
- (e) One bend test piece shall be prepared from each sample.

8. PHYSICAL TESTS.

- (a) The test samples selected and prepared as in Clause 7 shall comply with the following tests:—
 - Ultimate Tensile Strength: not less than 63,000 lbs./sq. inch.
 - Elongation (on standard gauge length): not less than 14 per cent.
- (b) Bend test pieces shall withstand bending through 180° around a diameter equal to twice the diameter of the test piece. Bars having a diameter greater than $\frac{3}{4}$ inch may be reduced to $\frac{3}{4}$ inch diameter for this test.

9 RE-TESTS.

If any test piece fails to comply with any of the physical tests specified in Clause 8:—

- (a) The manufacturer may withdraw the parcel represented by the test piece; or
- (b) Two further samples from the same parcel may be selected, one sample of which shall be from the bar from which the original test piece was taken, unless that bar has been withdrawn by the manufacturer. If either sample fails to meet the requirements of Clause 8 the parcel may be rejected; or
- (c) The manufacturer may heat treat and re-submit the parcel for inspection and testing.

10. RELEASE CERTIFICATE.

Two copies of a release certificate shall be supplied to Commonwealth Aircraft Corporation Pty. Ltd., covering each batch of material, indicating compliance with the requirements of this specification, and in particular specifying the chemical composition of the material and the results of physical tests called for in Clause 8.

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11. REJECTION OF MATERIAL.

- (a) Any or all of a parcel of bars may be rejected by Commonwealth Aircraft Corporation Pty. Ltd. for failure to meet any of the requirements of this specification.
- (b) The whole of a parcel of bars shall be rejected by the manufacturer if the relevant test samples fail to meet the requirements of Clauses 8 and 9.
- (c) Commonwealth Aircraft Corporation Pty. Ltd. reserves the right to prepare test pieces from any bar and test them for compliance with Clause 8. The manufacturer or his representative may, if desired, witness this test, provided that he duly notifies this intention in writing at the time of forwarding the material.

12. APPROVED SUBSTITUTE MATERIALS.

Notwithstanding any of the requirements of this specification, materials conforming to the undermentioned specification and accompanied by satisfactory certificates as to compliance with the requirements of such specification may be accepted by Commonwealth Aircraft Corporation Pty. Ltd. as satisfying the requirements of this specification:—

Australian Standard Specification (E.) D. 543.