

Aircraft Material Specification
100 TON 3% CHROMIUM-MOLYBDENUM-VANADIUM STEEL
(Suitable for air hardening) (Limiting Ruling Section 1½ in.)

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 for aircraft material 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	..	..	..	<i>Bars and billets for forging.</i>
B	..	..	..	<i>Black and bright bars for machining.</i>
C	..	..	..	<i>Forgings.</i>
G	..	..	..	<i>Heat treated parts.</i>

1. Chemical composition

Carbon	..	..	..	not less than 0.35 nor more than 0.45 per cent.
Silicon	..	..	..	not less than 0.10 nor more than 0.35 per cent.
Manganese	..	..	..	not less than 0.4 nor more than 0.8 per cent.
Nickel	..	..	..	not more than 0.4 per cent.
Chromium	..	..	..	not less than 3.0 nor more than 3.5 per cent.
Molybdenum	..	..	..	not less than 0.8 nor more than 1.2 per cent.
Vanadium	..	..	..	not less than 0.1 nor more than 0.3 per cent.
Sulphur	..	..	..	not more than 0.045 per cent.
Phosphorus	..	..	..	not more than 0.045 per cent.

2. Process of manufacture

Electric.

3. Rough machining

Section One, Clause 5.2 of British Standard 2S. 100.

4. Condition

- 4.1. Bars and billets for forging shall be supplied in the softened condition.
- 4.2. Bright bars for machining shall be supplied after having been softened and subsequently cold drawn, cold rolled or ground.
- 4.3. Black bars for machining shall be supplied in the softened condition.
- 4.4. Forgings shall be supplied in the softened condition.
- 4.5. Parts shall be made from bars or forgings complying with this Specification and shall be supplied in the hardened and tempered condition.

5. Heat treatment

- 5.1. Machined parts and test pieces shall be hardened in air from a temperature between 940°C. and 980°C. They shall then be tempered by heating to a suitable temperature between 500°C. and 600°C.
- 5.2. An allowance for grinding may be left on machined parts if desired; if an allowance is left, they shall be finished by wet grinding after heat treatment.
- 5.3. No finished part shall be re-hardened more than twice.
- 5.4. A tensile and an Izod test piece shall be provided to represent each batch of machined parts made from the same cast and heat treated together.

6. Mechanical properties

0.1 per cent proof stress..	..	..	..	not less than 68 tons/sq. in.
Ultimate tensile stress	..	..	..	not less than 100 tons/sq. in.
Elongation	..	..	..	not less than 12 per cent.
Izod	..	..	..	not less than 10 ft. lb.

Brinell hardness number:—

Finished parts	..	..	not less than 444.
Softened material	..	..	not more than 277.

These properties are based on a test piece heat treated at 0.564 in. diameter.

7. Inspection and testing procedure

Bars and billets for forging	..	..	Sections One and Two of British Standard 2S.100.
Black and bright bars for machining	..	..	Sections One and Two of British Standard 2S.100.
Forgings	..	..	Sections One and Four of British Standard 2S.100.
Finished parts	..	..	Section One of British Standard 2S.100.

Approved for issue.

H. SUTTON,

Director of Materials Research and Development (Air).

Alcristal Material Specification
THE TON 1 CHROMIUM-NICKEL-IRON-VALENTIUM STEEL
(Suitable for air handling) (Working Range Section II (a))

NOTE.—This specification is one of a series issued by the Ministry of Supply, which is made a binding requirement not only by the Ministry of Supply, but also by the Ministry of Aircraft Production, for aircraft material, or to be used as a basis for the design of aircraft parts. It is intended to be used in preference to other specifications for similar materials, and is subject to the provisions of the Aircraft and Airframe Regulations, 1937, and to the provisions of the Aircraft and Airframe Regulations, 1938.

Table with 4 columns: Chemical composition, Mechanical properties, Heat treatment, and Other notes. Rows include details for various steel grades and their properties.

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Section II (a) of this specification is subject to the provisions of the Aircraft and Airframe Regulations, 1937, and to the provisions of the Aircraft and Airframe Regulations, 1938. The material shall be supplied in the form of sheets, plates, or bars, and shall be suitable for use in the construction of aircraft parts. The material shall be supplied in the form of sheets, plates, or bars, and shall be suitable for use in the construction of aircraft parts. The material shall be supplied in the form of sheets, plates, or bars, and shall be suitable for use in the construction of aircraft parts.