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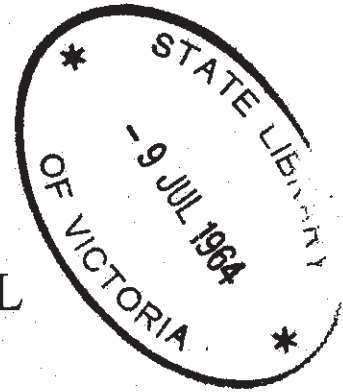
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**3 S. 80**, January, 1964  
(Replacing British Standard 2 S.80)

**BRITISH STANDARDS INSTITUTION**  
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BRITISH STANDARD SPECIFICATION  
FOR AIRCRAFT MATERIAL  
**HIGH CHROMIUM-NICKEL  
CORROSION-RESISTING STEEL**  
(55/65 tonf/sq in: limiting ruling section 6 in)



NOTE 1. Where metric equivalents are stated the figures in British units are to be regarded as the standard. Where Fahrenheit equivalents are stated, the temperatures in degrees Celsius are to be regarded as the standard. The conversions are approximate. More accurate conversions should be based on the tables in B.S. 350, 'Conversion factors and tables'.

NOTE 2. In place of the customary, but incorrect use of the pound, ton or kilogramme as units of force, the units called pound-force (abbreviation lbf), ton-force (abbreviation tonf) or kilogramme-force (abbreviation kgf) have been used in this standard. These are the forces which, when acting on a body of mass one pound, one ton or one kilogramme respectively, give it an acceleration equal to that of standard gravity.

**1. Inspection and testing procedure.**

**1.1** This British Standard shall be used in conjunction with the relevant sections of British Standard 3 S.100 as follows:

<i>Bars for machining delivered in other than the finally heat treated condition. (See Clause 5.1)</i>	Sections One and Two.
• Bars for machining delivered in the finally heat treated condition	Sections One and Three.
Billets and bars for forging	Sections One and Five.
Forgings	Sections One and Six.
Parts heat treated after machining	Sections One and Seven.

**1.2** *Sulphur printing or deep etching tests.* Samples shall be selected in accordance with British Standard 3 S.100, Section One, Clause 7.2.1.

**2. Process of manufacture.**

The material shall be manufactured by an electric process, unless otherwise agreed between the manufacturer and the purchaser in accordance with British Standard 3 S.100, Section One, Clause 3.1.

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sition.

ontain:

Element	Per cent	
	min.	max.
Carbon	0.10	0.25
Chromium	—	0.8
Manganese	—	1.0
Nickel	1.0	3.0
Vanadium	15.0	18.0
Nitrogen	—	0.025
Phosphorus	—	0.030

It shall be overall dressed in accordance with the requirements of British Standard One, Clause 5.1.

Material shall be supplied in the appropriate condition stated below unless otherwise specified between the manufacturer and the purchaser in which case the condition in which the material is to be supplied shall be stated on the order.

Material	Condition of supply
Black bars for machining	Finally heat treated
Bright bars for machining	Finally heat treated and cold drawn } before or or cold rolled } after final or machined } heat or ground } treatment.
Billets and bars for forging	Softened
Forgings	Finally heat treated

Material shall be supplied finally heat treated.

Notes:

As provided in Clause 6.3 the final heat treatment shall be: oil or air from a temperature between 950°C and 1020°C (1740°F and 1870°F) followed by tempering at a suitable temperature between 580°C and 650°C (1075°F and 1200°F). Forged and hot-rolled bars which have been subjected to a cold straightening or cold drawing operation shall be given a stress relieving treatment which shall be sufficient to remove any work hardening of stress.

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#### 7. Mechanical properties.

7.1 *Mechanical tests.* Except where they are required by British Standard 3 S.100 to be agreed between the manufacturer and the purchaser, the mechanical properties obtained from test pieces selected and prepared in accordance with the relevant requirements of British Standard 3 S.100 shall be:

0.1 per cent proof stress*		Tensile strength				Elongation per cent on gauge length		Impact	
tonf/sq in	kgf/mm <sup>2</sup>	tonf/sq in		kgf/mm <sup>2</sup>		5.65 √S <sub>0</sub>	4 √S <sub>0</sub>	Up to and including 2½ in ruling section	Over 2½ in ruling section
min.	min.	min.	max.	min.	max.	min.	min.	ft lbf	ft lbf
41	65	55	65	87	102	11	15	25	15

7.2 *Hardness.* The hardness of finally heat treated material and parts shall be not less than 248 HB nor more than 302 HB.

\*A proof stress of 43 tonf/sq in minimum may be obtained by heat treatment of suitable casts. By agreement between the manufacturer and the purchaser the following properties may be stipulated on the order:

0.1 per cent proof stress	Tensile strength		Elongation per cent on gauge length		Impact		Hardness	
					Up to and including 2½ in ruling section	Over 2½ in ruling section		
tonf/sq in	tonf/sq in		5.65 √S <sub>0</sub>	4 √S <sub>0</sub>	ft lbf		HB	
min.	min.	max.	min.	min.	min.	min.	min.	max.
43	60	70	11	15	15	10	269	321

This British Standard, having been approved by the Aircraft Industry Standards Committee and endorsed by the Chairman of the Engineering Divisional Council, was published under the authority of the General Council of the Institution on 31st January, 1964.

The Institution desires to call attention to the fact that this British Standard does not purport to include all the necessary provisions of a contract.

*British Standards are revised, when necessary, by the issue either of amendment slips or of revised editions. It is important that users of British Standards should ascertain that they are in possession of the latest amendments or editions.*