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(Replacing British Standard S.102)

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BRITISH STANDARD SPECIFICATION FOR AIRCRAFT MATERIAL

CARBON-MOLYBDENUM STEEL

(Wire only for the manufacture of forged bolts)

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 British Standard 3 S.100, Sections One and Nine.

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 open hearth or an electric process, unless otherwise agreed between the manufacturer and purchaser in accordance with British Standard 3 S.100, Section One, Clause 3.1.

3. Chemical composition.

The steel shall contain:

Element	Per cent	
	min.	max.
Carbon*	0·30	0·40
Silicon	0·10	0·35
Manganese	0·8	1·0
Molybdenum	0·20	0·35
Sulphur	—	0·040
Phosphorus	—	0·040

*It is permissible to specify either a 0·30/0·35, or 0·35/0·40 per cent carbon range on the order.

4. Surface dressing.

The material shall be overall dressed in accordance with the requirements of British Standard 3 S.100, Section One, Clause 5.1.

5. Condition.

The wire shall be delivered in one of the following conditions, as specified on the order:

Type 1. Annealed.
Type 2. Annealed and subsequently drawn.

Price 2/6 net.

6. Final heat treatment.

6.1 *Wire.* No detailed requirements are specified (see Clause 5).

6.2 *Bolts.* The heat treatment applicable to bolts made from this material and to their representative test samples is:

a. Harden in oil from a temperature of 850±10°C (1560±18°F).

b. Temper at a suitable temperature between 400°C and 660°C (750°F and 1220°F).

7. Mechanical properties.*

7.1 *Tensile test.* (Wire as delivered). The tensile strength of the test pieces selected and prepared in accordance with the relevant requirements of British Standard 3 S.100 shall be **not more** than:

Carbon per cent	Tensile strength			
	Type 1		Type 2	
	tonf/sq in	kgf/mm²	tonf/sq in	kgf/mm²
0·30 to 0·35	**35**	55	**40**	63
0·35 to 0·40	**37**	58	**42**	66

7.2 *Hardening test.* The hardness shall be not less than 400 HV.

*The relevant British Standard 'A' series specifications require the following mechanical properties of bolts and their representative test samples:

0.1 per cent proof stress		Tensile strength				Elongation per cent on gauge length		Impact
tonf/sq in	kgf/mm²	tonf/sq in		kgf/mm²		$5.65\sqrt{S_o}$	$4\sqrt{S_o}$	ft lbf
min.	min.	min.	max.	min.	max.	min.	min.	min.
43	68	**55**	**65**	87	102	13	18	40

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.

The following B.S.I. references relate to the work on this standard:
Committee reference ACE/15. Draft for comment D62/3645.

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