

**BSI****TA 45 : February 1973***(Superseding British Standard TA 29)*

UDC 629.7:669.295.5'71'28'6'782.018.23-422.2

British Standard: Aerospace Series Specification for

**Bar and section for machining  
of titanium-aluminium-molybdenum-tin-  
silicon alloy****(Tensile strength 1100-1280 N/mm<sup>2</sup>)  
(Limiting ruling section 25 mm)**

NOTE. Other forms of material of similar composition are covered by British Standards as listed in Appendix A.

**1. Inspection and testing procedure**

This British Standard shall be used in conjunction with Sections 1 and 2 of British Standard TA 100.

**2. Manufacture**

The material shall be made from ingots produced, by consumable electrode melting, from materials having a total carbon content of not more than 0.08 %.

**3. Chemical composition**

The chemical composition of the material shall be:

Element	%	
	min.	max.
Aluminium	3.0	5.0
Molybdenum	3.0	5.0
Tin	1.5	2.5
Silicon	0.3	0.7
Iron	—	0.20
Hydrogen	—	0.0125
Oxygen	—	0.25
Nitrogen	—	0.05
Titanium	—	Remainder

**4. Condition**

Unless otherwise stated on the drawing, order or Inspection Schedule, the material shall be supplied fully heat treated and either centreless ground or machined.

**5. Heat treatment**

The material and test samples shall be heat treated as follows:

- (1) heat at a temperature of  $900 \pm 10$  °C and hold for 1 h per 25 mm of section, with a minimum of 20 min;
- (2) cool in air;
- (3) heat at a temperature of  $500 \pm 5$  °C and hold for 24 h;
- (4) cool in air.

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## 6. Mechanical properties

6.1 The mechanical properties obtained from test pieces selected, prepared and tested in accordance with the relevant requirements of British Standard TA 100 shall be:

### 6.1.1 Tensile test at room temperature

0.2 % proof stress min.	Tensile strength		Elongation min.	Reduction of area min.
	min.	max.		
N/mm <sup>2</sup>	N/mm <sup>2</sup>	N/mm <sup>2</sup>	%	%
960	1100	1280	9	25

6.1.2 Creep test. When required and stated on the drawing, order or Inspection Schedule:

Maximum total plastic strain in 100 h under a load of 465 N/mm<sup>2</sup> at 400 °C: 0.10 %

NOTE. 1 N/mm<sup>2</sup> = 1 MN/m<sup>2</sup> = 1 MPa = 0.1 hbar = 0.065 tonf/in<sup>2</sup>. Information on SI units is given in BS 3763, 'The International System of units (SI)', and BS 350, 'Conversion factors and tables'.

## Appendix A. British standards covering other forms of material of similar composition

Tensile strength (N/mm <sup>2</sup> )	min.	1050	1050	1050	1000
	max.	1220	1220	1200	1200
Limiting ruling section (mm)	Over	25			100
	Up to and including	100	100	100	150
Form	British Standard				
Bar and section for machining	TA 46				TA 49
Forging stock		TA 47			TA 50
Forgings			TA 48		TA 51

This British Standard, having been approved by the Aerospace Industry Standards Committee, was published under the authority of the Executive Board on 2 February 1973.

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ISBN: 0 580 07447 1

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### Contract requirements

Attention is drawn to the fact that this British Standard does not purport to include all the necessary provisions of a contract.

### Revision of British Standards

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 BSI references relate to the work on this standard:  
Committee reference ACE/49 Draft for comment 71/33667

**Amendment Slip No. 1**  
**published and effective from 31 December 1980**  
**to British Standard TA 45 : 1973**  
**(Aerospace Series)**

**Bar and section for machining of titanium-**  
**aluminium-molybdenum-tin-silicon alloy**  
**(Tensile strength 1100 - 1280 N/mm<sup>2</sup>)**  
**(Limiting ruling section 25 mm)**

**Revised text**

AMD 3426  
 December 1980

**Clause 3. Chemical composition**

In the table, in the column headed 'max.', against 'Nitrogen', delete '0.05' and substitute '0.03'; below the requirement relating to nitrogen insert the following:

Oxygen + 2 x nitrogen	—	0.27
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ACE/49

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	min.	max.
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Oxygen	—	0.25
Nitrogen	—	0.05
Titanium	—	Remainder

**4. Condition**

Unless otherwise stated on the drawing, order or Inspection Schedule, the material shall be supplied fully heat treated and either centreless ground or machined.

**5. Heat treatment**

The material and test samples shall be heat treated as follows:

- (1) heat at a temperature of 900 ± 10 °C and hold for 1 h per 25 mm of section, with a minimum of 20 min;
- (2) cool in air;
- (3) heat at a temperature of 500 ± 5 °C and hold for 24 h;
- (4) cool in air.

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