

**Ministry of Defence
Defence Procurement Agency, ADRP2
Abbey Wood
Bristol
BS34 8JH**

OBSOLESCENCE NOTICE

All DTD specifications were declared obsolescent from 1st April 1999. All DTD 900 series approvals also lapsed at that time. The standards will no longer be updated but will be retained as obsolescent documents to provide for the servicing of existing equipment.

Further Guidance

The aim in declaring the specifications obsolescent is to recognise that the documents are not being updated and thus should be used with care by both purchaser and supplier. For example, a specification could contain valid technical information but may also contain type approval clauses that contradict procurement policy and/or use materials that do not comply with environmental legislation. The obsolescent specification can still be used as a basis for a purchase provided that the supplier and purchaser agree suitable changes to the specification within the purchase order/contract.

For the DTD 900 system, each specification has provided an MoD approved material and process. For these items, the declaration of obsolescence will constitute the termination of both the extant MoD approval and the continuing MoD assessment that had underpinned those approvals. Again, the technical content of the document remains valid and can be used by both purchaser and supplier as a basis for a contract but an acceptable (to the parties) approval/assessment procedure would be required.

Aircraft Material Specification

45-TON CHROME-MOLYBDENUM STEEL TUBES (Not suitable for welding)

NOTE.-This specification is one of a series issued by the Ministry of Aviation, 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.

Straight circular tubes

Bent circular tubes

Non-circular tubes

1. Chemical composition

Carbon	..	..	..	..	..	not less than 0.25 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 (residual)	..	..	..	..	..	not more than 0.5 per cent.
Chromium	..	..	..	..	..	not less than 0.8 nor more than 1.2 per cent.
Molybdenum	..	..	..	..	..	not less than 0.15 nor more than 0.25 per cent.
Sulphur	..	..	..	..	..	not more than 0.045 per cent.
Phosphorus	..	..	..	..	..	not more than 0.045 per cent.

2. Process of manufacture

- 2.1. Electric.
- 2.2. The tubes shall be straightened before heat treatment. Any subsequent re-straightening which may be necessary on tubes subject to proof bend testing shall not be carried out until the tubes have been subjected to the proof bend test.

3. Inspection procedure

- 3.1. Straight circular tubes ½ inch outside diameter and over.
Bent circular tubes ½ inch outside diameter and over for which the manufacturer's proof bend testing machine is suitable.
 } Sections 1 and 4 of British Standard T.100.
- 3.2. Straight circular tubes less than ½ inch outside diameter.
Bent circular tubes not suitable for proof bend testing
Non-circular tubes.
Tubes too short or too heavy for proof bend testing.
 } Sections 1 and 5 of British Standard T.100.

4. Margins of manufacture

- 4.1. Circular tubes in the drawn and tempered condition shall comply with the limits specified in Table 1 of British Standard T.100.
- 4.2. Circular tubes in the normalised and tempered or in the hardened and tempered condition shall comply with the limits specified in Table 2 of British Standard T.100.
- 4.3. Non-circular tubes shall comply with the limits specified in the appropriate Table 4 to 7 of British Standard T.100.

5. Heat treatment

- 5.1. Tubes shall be supplied in one of the following conditions at the option of the manufacturer :—
 - Drawn and tempered.
 - Normalised and tempered.
 - Hardened and tempered.
- 5.2. Tempered tubes shall be heated uniformly at a temperature of not more than 650°C. and cooled freely in air.
- 5.3. Normalised and tempered tubes shall be heated uniformly at a temperature of not more than 950° C. and cooled freely in air. They shall then be tempered to give the specified mechanical properties.
- 5.4. Hardened and tempered tubes shall be heated uniformly at a temperature of not more than 950° C. and quenched in oil or water. They shall then be tempered to give the specified mechanical properties.
- 5.5. No tube shall be re-normalised or re-hardened more than three times.

6. Mechanical tests6.1. *Tensile test.*

0.2 per cent. proof stress not less than 40 tons per sq. in.
(Applicable to tubes not subjected to proof bend testing).

Tensile strength not less than 45 tons per sq. in.

6.2. *Flattening test.*

Circular tubes :—

Distance between inner sides of test piece, in direction of flattening :— 5T or $\frac{3}{4}$ bore, whichever is the smaller.

Square and streamline tubes :—

Diagonal or major axis C, to be reduced by $\frac{0.5C}{T}$ per cent.

(e.g. if $\frac{C}{T} = 80$, then the required reduction is 40 per cent.).

6.3. *Bend test (alternative test).*

Radius of former 3T.

6.4. *Proof bend test.*

The deflection and proof bending moment shall be based on a bending stress of 40 tons per sq. in.
(See Table 8 of British Standard T.1000)

6.5. *Hardness test.*

(Applicable to all tubes over $\frac{1}{4}$ inch diameter not subjected to proof bend testing).

Brinell hardness number not less than 207.

Approved for issue,

N. J. L. MEGSON,

Director of Materials Research and Development (Air).

Printed in England by M. Harland & Son Ltd.

and published by

HER MAJESTY'S STATIONERY OFFICE

Price 6d. net