

**Ministry of Defence
Defence Procurement Agency, ADRP2
Abbey Wood
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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

**CELLULAR VULCANISED RUBBER FOR SELF SEALING FUEL TANKS
(FIGHTER TYPE)**

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 Specification 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.

1. Description

The material shall consist of vulcanised cellular natural rubber and shall be suitable for use as a sealing layer in self sealing tank coverings. It shall be supplied in the form of sheets having a continuous skin on both faces. The compound shall contain no paraffin wax or other similar substance, nor shall it contain more than two parts by weight of fatty acid per 100 parts of rubber.

2. Freedom from defects

The material shall be fine and uniform in texture and shall be free from flaws, holes or other imperfections likely to affect its service life or utility. The surface may have a shallow cloth mark finish. Occasional shallow surface defects produced by weaving faults in the fabric used during manufacture shall not be regarded as a cause for rejection.

3. Dimensions

(a.) The sheets of material shall be 36 inches wide and not less than 6 feet long, unless otherwise stated in the contract or order.

(b) The nominal thickness of the sheet material shall be 3.2 mm., and the thickness at any point, when determined in accordance with Appendix I shall be not less than 2.7 mm. nor more than 3.7 mm.

4. Weight

The maximum weight of the sheet material shall be 7 oz. per sq. ft.

5. Tensile strength and elongation at break

The tensile strength and elongation at break, when determined in accordance with British Standard 903 'Methods of testing vulcanized rubber', using type B dumb-bells cut from the sheet material with their lengths perpendicular to the direction of grain, shall be not less than 200 lbs. per sq. in. and 500 per cent. respectively. The thickness of the test pieces from which the dumb-bells are cut shall be determined in accordance with Appendix I.

6. Swelling in Aviation fuel

The minimum increase in volume of the material, when determined in accordance with Appendix II shall be as follows :-

After 1 minute 40 per cent.

After 10 minutes 110 per cent:

7. Resistance to accelerated ageing

After ageing for 168 hours in accordance with the oven method of British Standard 903, using type B dumb-bells, the tensile strength shall be within ± 20 per cent. and the elongation at break within + 0 and - 20 per cent. of the original values obtained in accordance with Clause 5.

8. Freedom from water-soluble corrosive impurities

When tested in accordance with Appendix III the material shall comply with the following requirements :-

- | | | | | | | |
|---|----|----|----|----|----|-------------|
| (i) Chlorides, calculated as C1 per cent. | .. | .. | .. | .. | .. | 0.1 maximum |
| Sulphates, calculated as S04 per cent. | .. | .. | .. | .. | .. | 0.2 maximum |
| (ii) Free acid | .. | .. | .. | .. | .. | Nil. |

In addition, it is highly desirable that Free Alkali calculated as KOH per cent. should not exceed 0.03.

9. Samples for testing.

Unless otherwise agreed, a batch of sheet material shall consist of that number of sheets or rolls produced from a uniform batch of rubber compound vulcanized under the same conditions. From each batch of sheet, at least one sample, approximately 9 in. along the length by 18 in. wide, shall be taken for test purposes.

APPENDIX I

Method for the Determination of Thickness

The thickness of the material shall be measured with a suitable dial-type gauge reading to 0.05 mm. or less, the foot of which shall be approximately 1 sq. in. in area and shall exert a pressure on the material of 1 oz. per sq. in.

APPENDIX II

Method for the Determination of Swelling in Aviation Fuel

Six test pieces, each 2 inches square, shall be cut as accurately as possible from the material. The length and width of each test piece shall be measured to the nearest hundredth of an inch with a steel rule along two reference lines drawn between the centres of opposite sides. Each test piece shall be placed in turn between two flat square glass plates each 3 oz. in weight and approximately 4 inches square.

The average thickness of the sandwiches thus formed shall be measured with the dial gauge described in Appendix I and the volume of each test piece calculated from the dimensions thus obtained and the measured thickness of the glass. Three of the test pieces shall then in turn be totally immersed in a mixture of 35 per cent. by volume of pure toluole (B.S. 805) and 65 per cent. by volume of iso-octane (I.P. reference fuel quality), at $20 \pm 2^\circ$ C. for one minute, at the end of which they shall be withdrawn and the dimensions again measured as described above. The interval between the withdrawal of the test pieces from the fuel and completion of the measurements shall not exceed one minute.

The three remaining test pieces shall be similarly treated but shall be allowed to remain totally immersed in the fuel for ten minutes.

The increase in volume of each test piece shall be expressed as a percentage of the original volume and the three results obtained in each set of tests shall be averaged.

APPENDIX III

Method for the Determination of Water-Soluble Corrosive Impurities

A water extract of the material shall be prepared in accordance with B.S. 903 "Methods of testing vulcanised rubber".

50 ml. of the aqueous extract shall be rapidly decanted and 1-2 drops of phenolphthalein indicator solution added. If a violet-red appears, the free alkali shall be determined by titration with N/100 hydrochloric acid.

If no violet-red colour appears (*i.e.* free alkali-nil), a further 10 ml. of the extract shall be treated with 1-2 drops of bromo-cresol green indicator solution. Unless a definite blue colour is produced the material shall be regarded as too acid for acceptance.

Aliquot portions of the remainder of the aqueous extract shall be used for determinations of chlorides and sulphates in accordance with B.S. 903.

Alternatively to the determination of chlorides and sulphates the electrical resistivity of a portion of the water extract shall be determined in accordance with B.S. 903, and the material may be regarded as complying with Clause 8(i) if the resistivity is not less than 6,500 ohm-cm.

Approved for issue.

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Director of Materials Research and Development (Air).

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