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Specification for

# Electrically conducting rubber flooring

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Spécification des revêtements de sol en  
caoutchouc conducteurs d'électricité

Spezifikation für elektrisch leitfähige Boden beläge  
aus Gummi

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## Foreword

This British Standard has been prepared under the direction of the Rubber Standards Committee and is a revision of the 1959 edition. In this revision, metric units are used throughout and the nominal thickness of rubber flooring is restricted to 6 mm (approximately  $\frac{1}{4}$  in) which represents the bulk of this type of flooring currently manufactured.

In locations where it is necessary to take precautionary measures against the accumulation of static electricity, e.g. in hospital operating theatres and certain buildings used for the manufacture and processing of explosives, the flooring forms an important link in providing a safe path for the discharge of electricity from objects and persons. Flooring intended to be used for this purpose should have uniform electrical conductance to a degree that will always ensure that, under the fastest rate of generation of any charge that can possibly occur in practice, a dangerous potential cannot exist.

Rubber is normally regarded as a material of high electrical resistivity, and in consequence is widely used as an insulator. However, the incorporation of certain materials, in particular certain forms of carbon black, greatly reduces its electrical resistivity so that volume resistivities down to  $100 \Omega \text{ m}$  are obtainable. Two types of flooring, with resistance reduced in this way, are recognized.

In some locations (e.g. buildings used for the manufacture of certain explosives) a predominant requirement is the provision of a comparatively low-resistance discharge path to earth. Special measures are then taken to eliminate the possibility of electric shock and fire by placing wiring and controls outside the zone of risk, and the use of portable electric equipment and flexible connections is prohibited. An upper limit is placed on the maximum permitted electrical resistance of the flooring, and there is no lower

limit. Rubber flooring with these electrical characteristics is designated 'electrically conducting', and forms the subject of this British Standard.

In a somewhat different situation, where electrical equipment is used in which the development of a fault could give rise to the risk of shock or fire, it is essential that the flooring, whilst being sufficiently conducting to disperse static charges, should also have sufficient resistance to limit any leakage current from the electrical installation or apparatus through the floor to earth. Consequently, flooring for such applications must have a resistance prescribed, with both the upper and lower limits clearly defined. Material with these electrical characteristics is designated 'antistatic' and is covered by BS 2050.

**Warning.** It is essential that electrically conducting rubber flooring in accordance with this British Standard be used only in those situations where the special precautions mentioned above are taken in the design, installation and maintenance of the electrical installation and equipment, so as virtually to eliminate the possibility of electric shock and fire.

It is strongly recommended that a warning notice, stating that the floor is conducting, should be displayed in any room fitted with conducting rubber flooring.

**Earthing.** Although flooring of either type may be earthed fortuitously, by contact with subfloors, service pipes, earthed metal of apparatus, etc., a more reliable method of earthing is considered to be necessary for electrically conducting flooring. It is recommended that such flooring be laid on a metal earthing grid or other suitable system, having a permanent low-resistance connection to earth.

Further guidance on the arrangement of a grid and other aspects of earthing and laying are given in appendix E.

British Standard Specification for

# Electrically conducting rubber flooring

## 1. Scope

This British Standard specifies requirements for electrically conducting rubber flooring.

## 2. References

The titles of the standards publications referred to in this standard are listed on the inside back cover.

## 3. Composition

The flooring shall be made from good quality raw natural or synthetic rubber or a mixture of these in conjunction with other suitable compounding ingredients. The finished flooring shall contain not less than 35 % by volume of new rubber when determined as described in BS 903 : Parts B11 and B12. Particular care should be taken to exclude substances likely to form an insulating bloom.

The electrically conducting properties shall be achieved by the use of carbon black, unless otherwise agreed between the purchaser and the supplier.

If it is essential, for safety reasons, that all the ingredients of the rubber compound are compatible with substances with which it may come into contact, the purchaser shall have prior consultation with the manufacturer.

## 4. Workmanship

The rubber forming the flooring shall be satisfactorily vulcanized and free from bloom. The material shall be free from porosity and grit, and the wearing surface shall be smooth and plain. The non-wearing surface shall be plain but shallow cloth marking of that surface is permissible.

## 5. Dimensions

**5.1 Thickness.** The nominal thickness of the rubber flooring shall be 6 mm. Other nominal thicknesses may be used by agreement between purchaser and supplier.

The total thickness of the flooring, when measured in accordance with appendix A, shall not differ at any point by more than  $\pm 0.3$  mm from the nominal thickness.

If cloth marking is present, the thickness of the flooring shall in addition be measured, using the apparatus described in appendix A, at three measuring points taken at one end of the roll. The cloth-marked side shall then be buffed down until the marks just disappear. After buffing, the thickness at any of the three measuring points shall not differ from the original unbuffed thickness at the respective point by more than 0.6 mm.

**5.2 Length and width.** The material shall, unless otherwise agreed, be not less than 900 mm wide and supplied in lengths of not less than 3.6 m.

## 6. Hardness

The nominal hardness of the finished flooring shall be as agreed between the purchaser and the manufacturer and shall be neither less than 76 IRHD nor greater than 96 IRHD.

The hardness of the finished flooring, when measured by method N or method H (as appropriate) of BS 903 : Part A26 : 1969, shall not differ by more than the values given in table 1 from the nominal hardness previously agreed between the purchaser the manufacturer.

**Table 1. Tolerances on nominal hardness**

Nominal hardness IRHD	Tolerance IRHD
76 up to and including 86	$\pm 4$
Over 86 up to and including 96	$\pm 3$

## 7. Compression set

Three test pieces in new condition and three test pieces aged for 168 h at 70 °C in accordance with either method A or method B of BS 903 : Part A19 : 1975 shall be subjected to the compression test specified in appendix B. The resulting compression set, for both new and aged test pieces, shall not exceed 15 %. The test pieces shall show no signs of cracking.

## 8. Water absorption

The flooring, when tested by the method described in appendix C, shall not absorb more than 4.0 mg of water per square centimetre of surface

## 9. Electrical resistance

**9.1 Before laying.** The electrical resistance of the rubber flooring before laying, when determined by the method described in appendix D of BS 2050 : 1961, shall not exceed  $5 \times 10^4 \Omega$ .

NOTE. It should be noted that the electrical resistance of laid flooring may be greater than that of unlaied flooring, depending on the earthing system adopted.

**9.2 After laying.** After the flooring has been laid, its electrical resistance at any point, when determined by the method described in appendix D of this standard, shall not exceed  $5 \times 10^4 \Omega$ .