

Specification for

**Printed
pressure-sensitive,
adhesive-coated labels
for marine use,
including requirements
for label base material**

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Committees responsible for this British Standard

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- British Fibreboard Packaging Association
- British Materials Handling Board
- British Photographic Association
- British Ports Association and the National Association of Ports Employers
- British Printing Industries Federation
- British Stationery and Office Products Federation
- Chemical Industries Association
- Department of Transport (Marine Directorate)
- Food Manufacturers' Federation Incorporated
- Institute of Packaging
- Ministry of Defence
- PIRA (the Research Association for the Paper and Board, Printing and Packaging Industries)
- Pressure Sensitive Manufacturers' Association
- Society of British Printing Ink Manufacturers

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Foreword

This revision of BS 5609 has been prepared under the direction of the Packaging and Freight Containers Standards Committee. It supersedes BS 5609:1978, which is withdrawn.

Under the provisions of the Merchant Shipping (Dangerous Goods) Regulations 1981 Statutory Instrument 1981 No. 1747¹⁾ it is obligatory for shippers to durably mark dangerous goods packages for carriage by sea. “Durably marked” means that the label or other marking in accordance with the provisions of these Regulations is such as to remain identifiable on packages which have been at least three months in the sea and the Regulations state that “durable” shall be construed accordingly. Labels manufactured to BS 5609 are regarded by the Department of Transport as complying with the Regulations and the Department from time to time issues a Merchant Shipping Notice listing firms which are said to supply labels to the standard.

Experience has shown that compliance with the performance requirements set out in BS 5609:1978 results in the production of a printed label which is capable, when properly applied, of providing the required durable marking. This revision, which makes only minimal changes to the performance requirements in respect of adhesion properties, has now been subdivided into sections in order to provide essential guidance to users in addition to specifying requirements.

Section 1 contains information concerning the obligation of the label user in connection with the marking of dangerous goods packages for carriage by sea and gives guidance on the effective application of labels.

Sections 2 and 3 contain the specification for the labels. Since label manufacture is essentially a two stage operation involving adhesive coating followed by printing, section 2 relates to the label base material and its adhesive and section 3 to the printing of the label.

Section 4 gives guidance to users on the selection and use of labels including recommended tests to check label performance on specific substrates.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 18, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

¹⁾ Obtainable from HMSO.

Section 1. General

0 Introduction

0.1 Responsibility of shippers

As stated in the foreword, it is obligatory for shippers to durably mark dangerous goods packages²⁾ for carriage by sea. To emphasize that responsibility for this rests with the shipper, this revision of BS 5609 has been expanded to include guidance to shippers to enable them to discharge those responsibilities.

Compliance with section 2 of the standard ensures adequate performance of the label base material and its adhesion to an aluminium substrate under marine conditions. Compliance with section 3 of this standard ensures adequate colour fastness and durability of the inks or dyes when used with a suitable label material.

It remains for the shipper, having noted the points outlined in **0.2** to carry out such tests as are necessary to satisfy himself as to the adequate performance of the labels as applied in normal use to the packages being shipped. Guidance for this purpose is given in section 4.

0.2 Summary of legal requirements

The International Maritime Dangerous Goods Code³⁾, which applies to shipment of dangerous goods by sea from most maritime countries, contains provisions that, unless otherwise provided in the Code, each package containing dangerous goods should be durably marked with the proper shipping name of the contents and should be durably identified with distinctive label(s)⁴⁾ (or stencil(s) of the labels). It further provides that the method of marking the name and affixing the label should be such that the name and label (or stencil) will still be identifiable on packages surviving at least three months' immersion in the sea.

The UK Merchant Shipping (Dangerous Goods) Regulations 1981, Regulation 9(1), enforces such provisions and applies to packaged dangerous goods taken on board a ship within the United Kingdom or its territorial waters. Subparagraph (c) of Regulation 9(1) requires that where the outer material of the package survives such immersion, the marking shall be durable (see foreword). Subparagraph (d) requires that where the outer package will not survive at least three months' immersion in the sea, any inner receptacles which will survive shall be durably marked with an indication of the nature of the danger to which the goods give rise. This paragraph is particularly relevant to, for example, small plastics or metal receptacles overpacked in fibreboard cartons.

NOTE Reference should be made to the Regulations for detailed information while further guidance may be found in Merchant Shipping Notices issued from time to time by the Department of Transport.

1 Scope

This British Standard specifies requirements for printed pressure-sensitive, adhesive-coated labels suitable for use under marine conditions.

It describes methods for the determination of resistance to marine immersion, weathering, temperature cycling and abrasion and for the determination of legibility and print key effectiveness and includes a recommended method for the evaluation of label adhesion to specific substrates.

The standard is subdivided to separate the requirements for the adhesive-coated label base material from those for the printed adhesive-coated label.

Since such labels are used particularly for the labelling of dangerous goods when transit by sea is intended, the importance of proper application is recognized by the provision in section 4 of guidance to users on label selection and application.

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

²⁾ Packages in this context includes large containers such as portable tanks and freight containers.

³⁾ Published by and obtainable from the Publications Department, International Maritime Organization, 4 Albert Embankment, London SE1 7SR.

⁴⁾ The "diamond" label.

2 Responsibility for compliance

This British Standard specifies requirements for both the printed adhesive-coated label and the adhesive-coated label base material. It shall be the responsibility of the manufacturer of the label base material to ensure compliance with section 2. It shall be the responsibility of the manufacturer/printer of the printed label to ensure compliance with the requirements of section 3, using label base material that complies with section 2.

3 Definitions

For the purposes of this British Standard the following definitions apply.

3.1

printed label

a piece of label material of defined dimensions, bearing a text or symbol

3.2

label base material

a flexible material to which a pressure-sensitive adhesive has been applied as an integral part of the construction

3.3

pressure-sensitive adhesive

an adhesive that produces a permanently tacky film to which a second adherend readily adheres after the brief application of pressure

3.4

substrate

the surface to which the label is applied in use, including any coating or finish

3.5

type test

a test directed towards approval of a label base material type to check whether it complies with section 2 of this standard

Section 2. Pressure-sensitive, adhesive-coated label base material

4 Performance requirements

NOTE A summary of performance requirements and test method references is given in Table 1.

4.1 Marine performance type test

A marine performance type test shall be performed on each adhesive-coated label base material. The test shall be repeated whenever changes are made to the flexible base material or the adhesive.

After exposure to marine conditions for at least 3 months the adhesion of each specimen shall be not less than 10 N per 25 mm width when test specimens have been:

- a) preconditioned for 24 h at 23 ± 2 °C and 50 ± 5 % r.h.;
- b) applied as described in A.1 to test plates prepared in accordance with Appendix B;
- c) conditioned when adhered to the test plates, for 48 h at 23 ± 2 °C and 50 ± 5 % r.h.;
- d) exposed on the test plates as described in;
- e) tested, after exposure, in accordance with Appendix D.

4.2 Laboratory performance type tests

4.2.1 Dimensional stability. The dimensions shall not alter by more than + 1, – 3 % when test specimens have been:

- a) preconditioned for 24 h at 23 ± 2 °C and 50 ± 5 % r.h.;
- b) applied and measured as described in A.2 using test plates prepared in accordance with Appendix B;
- c) conditioned when adhered to the test plates, for 48 h at 23 ± 2 °C and 50 ± 5 % r.h.;
- d) submitted to artificial weathering in accordance with Appendix E;
- e) re-measured.

4.2.2 Adhesion after 48 h. The adhesion shall be not less than 12.5 N per 25 mm width when test specimens have been:

- a) preconditioned for 24 h at 23 ± 2 °C and 50 ± 5 % r.h.;
- b) applied as described in A.3 to test plates prepared in accordance with Appendix B;
- c) conditioned when adhered to the test plates, for 48 h at 23 ± 2 °C and 50 ± 5 % r.h.;
- d) tested in accordance with Appendix D.

4.2.3 Adhesion after artificial weathering. The adhesion shall be not less than 12.5 N per 25 mm width when test specimens have been:

- a) preconditioned for 24 h at 23 ± 2 °C and 50 ± 5 % r.h.;
- b) applied as described in A.3 to test plates prepared in accordance with Appendix B;
- c) conditioned when adhered to the test plates, for 48 h at 23 ± 2 °C and 50 ± 5 % r.h.;
- d) submitted to artificial weathering in accordance with Appendix E;
- e) tested in accordance with Appendix D.

4.2.4 Adhesion after temperature cycling. The adhesion shall be not less than 12.5 N per 25 mm width when test specimens have been:

- a) preconditioned for 24 h at 23 ± 2 °C and 50 ± 5 % r.h.;
- b) applied as described in A.3 to test plates prepared in accordance with Appendix B;
- c) conditioned when adhered to the test plates, for 48 h at 23 ± 2 °C and 50 ± 5 % r.h.;
- d) submitted to temperature cycling in accordance with Appendix F;
- e) tested in accordance with Appendix D.

4.2.5 Colour fastness. The colour of the label base material shall remain recognizable as the original hue and the colour fastness rating shall be not less than 2 compared with an unweathered specimen when test specimens have been:

- a) applied to test plates or panels suitable for use with the salt spray apparatus described in Appendix E;
- b) submitted to artificial weathering in accordance with Appendix E;
- c) checked as described in G.1 using the grey scale of BS 1006-A02C.

NOTE The assessment for colour fastness may be carried out, if appropriate, on test specimens which have undergone artificial weathering for the adhesion test since the test procedure is similar (see 4.2.3).

4.3 Fitness for use

Label base materials shall be capable of complying with 4.1 and 4.2 for a period of not less than 2 years from date of delivery, when stored in accordance with the manufacturer's instructions or, in the absence of such instruction, at 20 ± 5 °C and not more than 75 % r.h.

5 Marking of consignments

Each package of label base material shall be legibly marked with:

- a) the name, trademark or other means of identifying the manufacturer/supplier;
- b) the material type;
- c) the number and year of this British Standard, i.e. BS 5609:1986, section 2⁵⁾ (unless this information has been supplied to the purchaser separately);
- d) the date of despatch from the manufacturer/supplier.

⁵⁾ Marking BS 5609:1986, section 2 in relation to label base material is a claim by the manufacturer that the product has been manufactured to the requirements of the standard. The accuracy of such a claim is therefore solely the manufacturer's responsibility. Enquiries as to the availability of third party certification should be addressed to the appropriate certification body.