



BS 3900 : Part E10 : 1979 ISO 4624-1978

[Pull-off test for adhesion]

UDC 667.613 : 620.179.4

British Standard Methods of test for paints

Part E10. Pull-off test for adhesion

[ISO title : Paints and varnishes — Pull-off test for adhesion]

Méthodes d'essai des peintures
Partie E10. Essai de traction

Prüfverfahren für Anstrichstoffe
Teil E10. Zugprüfung der Haftung

It is recommended that this Part be read in conjunction with the general information in the Introduction to BS 3900 issued separately (revised edition published March 1969).

National foreword

This Part of BS 3900 is identical with ISO 4624-1978 'Paints and varnishes — Pull-off test for adhesion' which was prepared by Technical Committee 35, Paints and varnishes, of the International Organization for Standardization (ISO), with the active participation and approval of the United Kingdom.

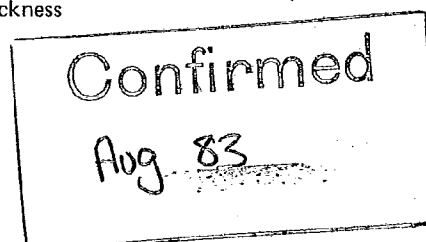
Terminology and conventions. The text of the international standard has been approved as suitable for publication, without deviation, as a British Standard. Some terminology and certain conventions are not identical with those used in British Standards; attention is especially drawn to the following.

The comma has been used in figure 3 as a decimal marker. In British Standards it is current practice to use a full point on the base line as the decimal marker.

Wherever the words 'International Standard' appear, referring to this standard, they should be interpreted as 'British Standard'.

Cross-references

International standard	Corresponding British Standard
ISO 1512-1974	BS 3900 Methods of test for paints Part A1 : 1970 Sampling (Technically equivalent)
ISO 1513-1973	BS 3900 Methods of test for paints Part A2 : 1970 Examination and preparation of samples for testing (Technically equivalent)
ISO 1514-1974	BS 3900 Methods of test for paints Part A3 : 1970 Standard panels for paint testing (Technically equivalent)
ISO 2808-1974	BS 3900 Methods of test for paints Part C5 : 1975 Determination of film thickness (Technically equivalent)



British Standards Institution

Gr 4

BS 3900 : Part E10 : 1979
[Pull-off test for adhesion]

0 INTRODUCTION

This International Standard is one of a series of standards dealing with the sampling and testing of paints, varnishes and related products. It should be read in conjunction with ISO 1512, ISO 1513, ISO 1514 and ISO 2808.

This International Standard specifies a method for assessing the adhesion of a single coating or a multi-coat system of paint, varnish or related product by measuring the minimum tensile stress necessary to detach or to rupture the coating in a direction perpendicular to the substrate.

The test result is influenced not only by the mechanical properties of the system under test, but also by the nature and preparation of the substrate, the method of paint application, the drying conditions of the coating, temperature, humidity and other factors.

The method of test specified below requires to be completed, for any particular application, by the following supplementary information. This information should be derived from the national standard or other document for the product under test or, if appropriate, shall be the subject of agreement between the interested parties.

- a) Material and surface preparation of test assembly surface or substrate.
- b) Method of application of test coating to the substrate or test cylinder, if appropriate.
- c) Duration and conditions of drying of the coating (or conditions of stoving and ageing, if applicable) before testing.
- d) Thickness, in micrometres, of the dry coating, including the method of measurement in accordance with ISO 2808, and whether it is a single coating or a multi-coat system.
- e) The adhesive (and mixing ratios, if applicable) and curing conditions (see also clause 4).
- f) Duration and conditions between assembly and testing.
- g) Type of pull-off test assembly used (see 7.3).
- h) Type of tensile tester and diameter of test cylinder.

* 1 MPa/s = 1 MN/m².s

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies methods for carrying out a pull-off test on a single coating or a multi-coat system of paint, varnish or related product.

The test may be applied using a wide range of substrates. Different procedures are specified according to whether the substrate is deformable, for example thin metal, plastics and wood, or rigid, for example thick concrete and metal plates. For special purposes, the coating may be applied to a test cylinder and, in this case, a method for determination of the coating thickness shall be agreed between the interested parties.

The test result is the minimum tensile stress necessary to break the weakest interface (adhesive failure) or the weakest component (cohesive failure) of the test assembly. Mixed adhesive/cohesive failures may also occur.

2 REFERENCES

ISO 1512, *Paints and varnishes — Sampling.*

ISO 1513, *Paints and varnishes — Examination and preparation of samples for testing.*

ISO 1514, *Paints and varnishes — Standard panels for testing.*

ISO 2808, *Paints and varnishes — Determination of film thickness.*

3 APPARATUS

3.1 Tensile tester, suitable for carrying out the chosen procedure specified in clause 7. The tensile stress shall be applied in a direction perpendicular to the plane of the coated substrate and shall be increased at a substantially uniform rate, not greater than 1 MPa/s*, such that failure of the test assembly occurs within 90 s. Suitable designs for applying the tensile stress are shown in figures 1 and 2.

3.2 Test cylinders, suitable for use with the tensile tester (3.1), steel faced, of diameter 20 mm (unless otherwise agreed) and of sufficient thickness to ensure freedom from distortion during the test. It is recommended that the length of the test cylinder should be not less than half its diameter. The faces shall be machined perpendicular to the long axis of the cylinder before use.