

Methods of test for

Adhesives —

Part G2: Determination of static shear strength of anaerobic adhesives

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Foreword

This Part of BS 5350 has been prepared under the direction of the Adhesives Standards Committee. Group G comprises several test methods chiefly intended for the assessment of the performance characteristics of anaerobic adhesives used primarily in mechanical engineering. They can also form part of a programme of assessment of the behaviour of anaerobic adhesives under a variety of environmental conditions. The method in this Part is based on a procedure in Aerospace Material Specification DTD 5628 “*Test methods and procurement procedures for one-part anaerobic polymerisable compounds for locking, sealing and retaining*”, issued by the Procurement Executive of the Ministry of Defence.

WARNING NOTE. This British Standard calls for the use of substances and/or procedures that may be injurious to health if adequate precautions are not taken. It refers only to technical suitability and does not absolve the user from legal obligations relating to health and safety at any stage.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 8, 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.

Amendments issued since publication

Amd. No.	Date of issue	Comments

This British Standard, having been prepared under the direction of the Adhesives Standards Committee, was published under the authority of the Board of BSI and comes into effect on 27 February 1987

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The following BSI references relate to the work on this standard:
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0 Introduction

Anaerobic adhesives are widely used as a means of securing engineering components. The strength of such bonds can be assessed by determining the static shear strength of a specified joint after curing under specified conditions. The test does not necessarily represent the performance of the material in service. A range of material strengths is required to meet various design purposes.

1 Scope

This Part of BS 5350 describes a method for the determination of the static shear strength of anaerobic adhesives. It is applicable to anaerobic adhesives capable of polymerizing on a steel surface in the absence of air (oxygen).

The primary aim of this test is for ranking and quality control of anaerobic adhesives and reliance should not be placed on any test results for design purposes.

Design data should preferably be obtained from tests using the construction materials and configurations used in the actual design.

This test may be used for quality control of types of adhesives other than anaerobic, if considered suitable, provided that the curing conditions are defined.

NOTE The titles of the publications referred to in this Part of BS 5350 are listed on inside back cover.

2 Definitions

For the purposes of this Part of BS 5350, the following definitions apply.

2.1

anaerobic adhesive

an adhesive that cures spontaneously in the absence of oxygen, curing being inhibited by the presence of oxygen and catalysed by metal ions

2.2

static shear strength

the force required to rupture a coaxial joint of given dimensions under specified conditions by a force applied along the major axis

3 Principle

The adhesive under test is used to lock a specified collar and pin together. The force required to rupture the coaxial joint is then measured. The increasing force is applied either directly by a machine operating at a constant crosshead speed in compression mode or indirectly by a tensile test machine, in which case an adaptor is required.

4 Supplementary information

This method of test requires the following supplementary information, which shall be stated when this method is specified.

- a) Curing conditions, other than those described in 6.4.2, if required for evaluating the adhesive in special circumstances.
- b) Details of the conditioning atmosphere and conditioning period.

5 Apparatus and materials

5.1 *Shallow non-metallic dish* of sufficient capacity to enable the pin and collar to be immersed in the adhesive under test.

5.2 *Compression or tensile test machine* complying with grade B of BS 5214-1. It shall be capable of providing a constant crosshead speed which can be set to a value that will achieve the required time to failure (see clause 7). It shall also be equipped with a facility for autographic recording.

5.3 *Adaptor or jig* to hold test pieces and to ensure that a compressive load is applied along the major axis of the test piece.

For use with a compression test machine, the jig shall be a rigid cylinder with parallel faces and a clearance hole for the pin (see Figure 1). For use with a tensile test machine, a compression cage is required to reverse the direction in which the force is applied (see Figure 2).

5.4 *Cabinet*, capable of being controlled at $23 \pm 2^\circ\text{C}$, and a chamber, if required for providing the conditioning atmosphere.

5.5 *Tweezers, tongs or disposable gloves*, for handling treated components.

5.6 *1,1,1-trichloroethane*, complying with BS 4487.

5.7 *Polyethylene sheets*

6 Test pieces

6.1 General

Each test piece shall consist of a bonded assembly of either:

- a) one collar and one pin [see Figure 3(a)];
- b) two collars and one pin [see Figure 3(b)].

The collars and pins shall comply with 6.2 and be prepared in accordance with 6.3.

6.2 Adherends

6.2.1 *General*. The collars and pins shall be so matched that the diametrical clearance is 0.025 mm to 0.050 mm.