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Rubber, vulcanized or thermoplastic — Determination of adhesion to a rigid substrate — 90° peel method

Caoutchouc vulcanisé ou thermoplastique — Détermination de l'adhérence à un substrat rigide — Méthode par pelage à angle droit

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 45, *Rubber and rubber products*, Subcommittee SC 2, *Testing and analysis*.

This fifth edition cancels and replaces the fourth edition (ISO 813:2010), of which it constitutes a minor revision concerning an update of the normative references.

Rubber, vulcanized or thermoplastic — Determination of adhesion to a rigid substrate — 90° peel method

WARNING 1 — Persons using this International Standard should be familiar with normal laboratory practice. This International Standard does not purport to address all of the safety problems, if any, associated with its use. It is the responsibility of the user to establish appropriate safety and health practices and to ensure compliance with any national regulatory conditions.

WARNING 2 — Certain procedures specified in this International Standard may involve the use or generation of substances, or the generation of waste, that could constitute a local environmental hazard. Reference should be made to appropriate documentation on safe handling and disposal after use.

1 Scope

This International Standard specifies a method for the determination of the adhesive strength of a vulcanized or thermoplastic rubber bonded to a rigid substrate, using a test piece comprising a strip of rubber bonded to a single plate of rigid material. The test is carried out at a peel angle of 90°.

The method is applicable primarily to test pieces prepared in the laboratory under standard conditions, such as can be used to provide data for the choice of rubber compounds or adhesive systems, the development of such materials and the control of manufacturing processes.

This method is not suitable for high-hardness rubbers, typically above 85 IRHD.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 5893, *Rubber and plastics test equipment — Tensile, flexural and compression types (constant rate of traverse) — Specification*

ISO 18899:2013, *Rubber — Guide to the calibration of test equipment*

ISO 23529, *Rubber — General procedures for preparing and conditioning test pieces for physical test methods*

3 Principle

The force required to cause separation of a strip of rubber bonded to a rigid substrate is measured, the angle of separation being 90° and the width and thickness of the rubber and the rigid material being fixed within specified limits.

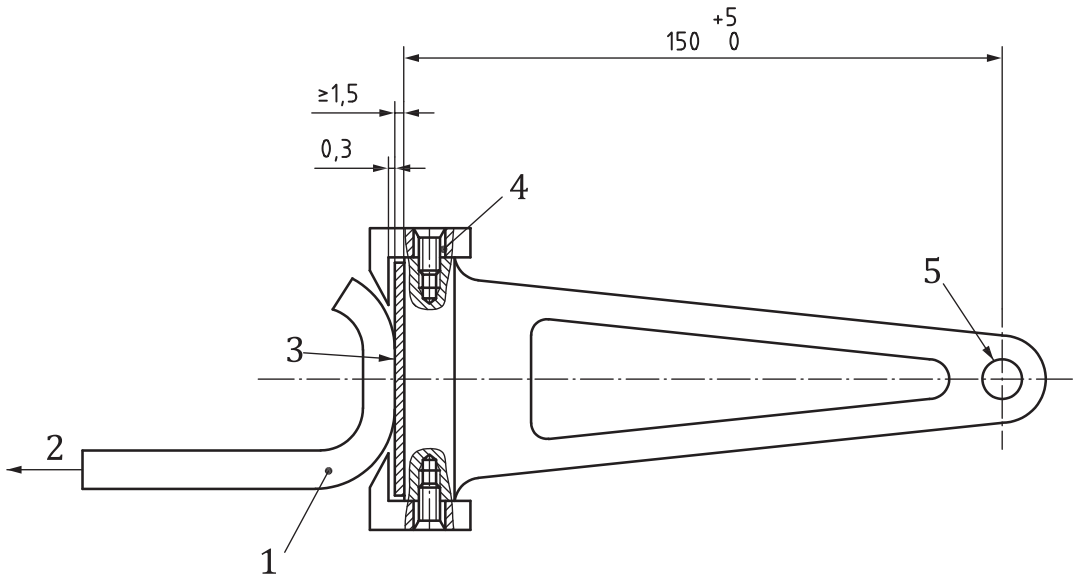
4 Apparatus

4.1 Tensile-testing machine, complying with the requirements of ISO 5893, capable of measuring force with an accuracy corresponding to class 1 and with a rate of traverse of the moving grip of 50 mm/min ± 5 mm/min.

4.2 Fixture, for holding the test piece to the moving grip of the testing machine (4.1) so that the direction of pull to cause separation is at all times during the test as nearly perpendicular as possible

to the plane of the bond between the rubber and the rigid substrate, i.e. making an angle of 90° with the face of the fixture. The fixture shown in Figure 1 complies with this requirement.

Dimensions in millimetres



Key

1 rubber
2 tensile force
3 rigid substrate
4 adjustment grooves
5 attachment to upper grip of test machine

Figure 1 — Example of test fixture

4.3 Grip, so designed that it does not allow the rubber to slip or cause it to rupture.

4.4 Temperature-controlled chamber (if needed), for carrying out tests at a chosen temperature which can be kept within the tolerances given in ISO 23529.

5 Test pieces

5.1 Dimensions

The standard test piece shall consist of a strip of rubber 6 mm ± 0,1 mm thick in the test area, 25 mm ± 0,1 mm wide and 125 mm long, bonded to a square area, 25 mm long and 25 mm ± 0,1 mm wide on the surface of a strip of rigid substrate, the determination of the dimensions of the test piece being in accordance with ISO 23529.

The substrate shall be sufficiently thick to prevent deformation during the test: a minimum thickness of 1,5 mm is recommended. The width shall be 25 mm ± 0,1 mm and the length, 60 mm ± 1 mm.

Each test piece shall be prepared so that the bonded area, 25 mm long and 25 mm ± 0,1 mm wide, is approximately in the middle of the substrate as shown in Figure 2.