International Standard

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Corrosion protection of steel structures by protective paint systems — Assessment of, and acceptance criteria for, the adhesion/cohesion (fracture strength) of a coating —

Part 1:
Pull-off testing

Protection contre la corrosion des structures en acier par systèmes de peinture — Évaluation et critères d'acceptation de l'adhésion/cohésion (résistance à la rupture) d'un revêtement —

Partie 1: Essai d'arrachement par traction

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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 document 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).

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This document was prepared by Technical Committee ISO/TC 35, *Paints and varnishes*, Subcommittee SC 14, *Protective paint systems for steel structures,* in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 139, *Paints and varnishes,* in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This second edition cancels and replaces the first edition (ISO 16276-1:2007), which has been technically revised.

The main changes are as follows:

— the content and the structure have been revised.

A list of all parts in the ISO 16276 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user’s national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Introduction

The main purpose of this document is to supplement the ISO 12944 series with regard to the field assessment of, and acceptance criteria for, the adhesion/cohesion of a coating.

To comply with this document, laboratory testing of panels can be required.

This document introduces the term fracture strength, which includes both adhesion and cohesion. Adhesion and cohesion are defined in ISO 4618, whereas the ISO 12944 series uses the term “adhesion” only.

This document applies to the assessment of pull-off testing of paint coatings on steel structures on site. ISO 4624 specifies a pull-off test for laboratory use, without instructions for interpretation of the results and without acceptance or rejection criteria.

Fracture strength testing is normally destructive and therefore requires repair work, the extent of which will depend on the specification and the durability required of the protective paint coating.

This document aims to provide uniformity in the assessment of the fracture strength of a coating and to establish acceptance/rejection criteria for protective paint coatings. The method specified in this document uses test equipment based on the pull-off principle; push-off adhesion testing is excluded.

Protective paint systems which have poor adhesion/cohesion normally fail at fracture strength values significantly lower than the values quoted in the specification.

For a protective paint system with a particular fracture strength, a range of test values are obtained from different types of equipment.

Specifying test equipment that gives the highest test values for a particular fracture strength does not necessarily indicate a higher durability for that protective paint system.

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Corrosion protection of steel structures by protective paint systems — Assessment of, and acceptance criteria for, the adhesion/cohesion (fracture strength) of a coating —

Part 1: Pull-off testing

1 Scope

This document specifies procedures for assessing the fracture strength of a protective paint coating of any thickness on a steel substrate of thickness not less than 3 mm. The procedures given in document are based on methods used with different types of pull-off test equipment. The results obtained using such different types of equipment are not comparable.

This document is only applicable if a fracture strength value is specified, together with the type of test equipment and the manufacturer of the equipment. Usually, this information is included in contract documentation.

This document also specifies suitable equipment and defines inspection areas, sampling plans and acceptance/rejection criteria.

It does not give any values of the fracture strength of different protective paint coatings.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 4624, *Paints and varnishes — Pull-off test for adhesion*

ISO 19840, *Paints and varnishes — Corrosion protection of steel structures by protective paint systems — Measurement of, and acceptance criteria for, the thickness of dry films on rough surfaces*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
fracture strength
force required to exceed the attachment forces:

— between coats or between coat and substrate [*adhesion* (3.2)]; and/or

— within a coat [*cohesion* (3.3)]

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