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Second edition
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Preparation of steel substrates before application of paints and related products — Surface roughness characteristics of blast-cleaned steel substrates —

Part 1:

Specifications and definitions for ISO surface profile comparators for the assessment of abrasive blast-cleaned surfaces

Préparation des subjectiles d'acier avant application de peintures et de produits assimilés — Caractéristiques de rugosité des subjectiles d'acier décapés —

Partie 1: Spécifications et définitions des comparateurs viso-tactiles ISO pour caractériser les surfaces décapées par projection d'abrasif



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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 8503-1 was prepared by Technical Committee ISO/TC 35, *Paints and varnishes*, Subcommittee SC 12, *Preparation of steel substrates before application of paints and related products*.

This second edition cancels and replaces the first edition (ISO 8503-1:1988), which has been technically revised.

ISO 8503 consists of the following parts, under the general title *Preparation of steel substrates before application of paints and related products — Surface roughness characteristics of blast-cleaned steel substrates*:

- *Part 1: Specifications and definitions for ISO surface profile comparators for the assessment of abrasive blast-cleaned surfaces*
- *Part 2: Method for the grading of surface profile of abrasive blast-cleaned steel — Comparator procedure*
- *Part 3: Method for the calibration of ISO surface profile comparators and for the determination of surface profile — Focusing microscope procedure*
- *Part 4: Method for the calibration of ISO surface profile comparators and for the determination of surface profile — Stylus instrument procedure*
- *Part 5: Replica tape method for the determination of the surface profile*

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Introduction

The performance of protective coatings of paint and related products applied to steel is significantly affected by the state of the steel surface immediately prior to painting. The principal factors that are known to influence this performance are:

- a) the presence of rust and mill scale;
- b) the presence of surface contaminants, including salts, dust, oils and greases;
- c) the surface profile.

International Standards ISO 8501 (all parts), ISO 8502 (all parts) and ISO 8503 (all parts) have been prepared to provide methods of assessing these factors, while ISO 8504 (all parts) provides guidance on the preparation methods which are available for cleaning steel substrates, indicating the capabilities of each in attaining specified levels of cleanliness.

These International Standards do not contain provisions for the protective coating systems to be applied to the steel surface or for the surface quality provisions for specific situations, even though surface quality can have a direct influence on the choice of protective coating to be applied and on its performance. Such provisions are found in other documents, such as national standards and codes of practice.

It is necessary for the users of these International Standards to ensure that the qualities specified are:

- compatible and appropriate both for the environmental conditions to which the steel is exposed and for the protective coating system to be used;
- within the capability of the cleaning procedure specified.

The four International Standards referred to above deal with the following aspects of preparation of steel substrates:

- ISO 8501: Visual assessment of surface cleanliness;
- ISO 8502: Tests for the assessment of surface cleanliness;
- ISO 8503: Surface roughness characteristics of blast-cleaned steel substrates;
- ISO 8504: Surface preparation methods.

Irrespective of the procedures and the type of abrasive used for the preparation of steel substrates, the surface after blast-cleaning consists of random irregularities with peaks and valleys that are not easily characterized. Consequently, it was concluded that, because of this random nature, no method is capable of giving a precise value for the profile. Thus, it is intended that the profile be identified as either dimpled (where shot abrasives are used) or angular (where grit abrasives are used) and that it be graded as "fine", "medium" or "coarse", each grade being defined by the limits specified in this part of ISO 8503. These surface characteristics are considered to give sufficient distinguishing features for most painting requirements.

Particular attention, however, is drawn to the fact that the grades "fine", "medium" and "coarse" represent different ranges in terms of roughness parameters, dependent upon whether these grades are applied to shot abrasive or grit abrasive blast-cleaned surfaces. In consequence, the effect produced on a given coating by a given grade "fine", "medium" or "coarse" is determined not only by the specific surface character but also by the specific roughness value $\overline{R_{y5}}$ or $\overline{h_y}$ belonging to that grade. Where surface profile is particularly important, both the grade of the surface profile ("fine", "medium" or "coarse") and the type of abrasive which is to be used are to be specified.

This part of ISO 8503 specifies the limits for the "fine", "medium" and "coarse" surface for both dimpled and angular profiles, and specifies the design of ISO comparators for reference purposes.

Requirements regarding the care of ISO surface profile comparators are given in Annex A.

ISO 8503-2 describes the method of using these ISO comparators. The many abrasive blast-cleaning procedures in common use are described in ISO 8504-2.