

**Teraspindade ettevalmistamine enne värvide ja nendega seotud materjalide pealekandmist. Pritspuhastatud teraspinna kareduse iseloomustus. Osa 1: Tehnilised andmed ja määratlused ISO pinnaprofiilikomparaatorite kohta, mis on ette nähtud abrasiiviga pritspuhastatud pindade hindamiseks**

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

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ICS 25.220.10

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Descriptors: Coating, surface roughness parameters, steel, surface profile comparators.

**English version**

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  
(ISO 8503-1:1988)

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 relatives aux  
échantillons de comparaison viso-tactile  
ISO pour caractériser les surfaces  
préparées par projection d'abrasif  
(ISO 8503-1:1988)

Vorbereitung von Stahloberflächen vor  
dem Auftragen von Beschichtungstoffen;  
Rauheitskenngrößen von gestrahlten  
Stahloberflächen. Teil 1: Anforderungen  
und Begriffe für ISO-Rauheitsvergleichs-  
muster zur Beurteilung gestrahlter  
Oberflächen (ISO 8503-1:1988)

This European Standard was approved by CEN on 1995-03-14 and is identical to the ISO Standard as referred to.

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**CEN**

European Committee for Standardization  
Comité Européen de Normalisation  
Europäisches Komitee für Normung

**Central Secretariat: rue de Stassart 36, B-1050 Brussels**

## Foreword

International Standard

ISO 8503-1:1988 Preparation of steel substrates before application of paints and related products; surface roughness characteristics of blast-cleaned steel substrates; specifications and definitions for ISO surface profile comparators for the assessment of abrasive blast-cleaned surfaces,

which was prepared by ISO/TC 35 'Paints and varnishes' of the International Organization for Standardization, has been adopted by Technical Committee CEN/TC 139 'Paints and varnishes' as a European Standard.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, and conflicting national standards withdrawn, by November 1995 at the latest.

In accordance with the CEN/CENELEC Internal Regulations, the following countries are bound to implement this European Standard:

Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

## Endorsement notice

The text of the International Standard ISO 8503-1:1988 was approved by CEN as a European Standard without any modification.

NOTE: Normative references to international publications are listed in Annex ZA (normative).

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## 0 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, ISO 8502 and ISO 8503 have been prepared to provide methods of assessing these factors, while ISO 8504 provides guidance on the preparation methods that are available for cleaning steel substrates, indicating the capabilities of each in attaining specified levels of cleanliness.

These International Standards do not contain recommendations for the protective coating systems to be applied to the steel surface. Neither do they contain recommendations for the surface quality requirements 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 recommendations are found in other documents such as national standards and codes of practice. It will be 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 will be 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*.

Each of these International Standards is in turn divided into separate parts.

Irrespective of the procedures and the type of abrasive that are 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 recommended that the profile should be identified as either dimpled (where shot abrasives have been used) or angular (where grit abrasives have been used) and that it should 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 ( $R_{Vs}$  or  $h_V$ ) 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 should 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 comparators for reference purposes.

Recommendations regarding the care of ISO surface profile comparators are given in the annex.

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

## 1 Scope and field of application

This part of ISO 8503 specifies the requirements for ISO surface profile comparators which are intended for visual and tactile comparison of steel substrates that have been blast-cleaned with either shot abrasives or grit abrasives. ISO surface profile comparators are for use in assessing, on site, the roughness of surfaces before the application of paints and related products or other protective treatments.

NOTE — Where appropriate, these comparators may be used for assessing the roughness profile of other abrasive blast-cleaned substrates and, in addition, their use is not restricted solely to surfaces that are to be painted.

This part of ISO 8503 also includes definitions of the terms used in this and the other parts of ISO 8503.

## 2 References

ISO 2632-2, *Roughness comparison specimens — Part 2: Spark-eroded, shot-blasted and grit-blasted, and polished.*

ISO 4287-1, *Surface roughness — Terminology — Part 1: Surface and its parameters.*

ISO 4618, *Paints and varnishes — Vocabulary.*

ISO 8501-1, *Preparation of steel substrates before application of paints and related products — Visual assessment of surface cleanliness — Part 1: Rust grades and preparation grades of uncoated steel substrates and of steel substrates after overall removal of previous coatings.*

ISO 8503, *Preparation of steel substrates before application of paints and related products — Surface roughness characteristics of blast-cleaned steel substrates*

— *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.*

ISO 8504-2, *Preparation of steel substrates before application of paints and related products — Surface preparation methods — Part 2: Abrasive blast-cleaning.*<sup>1)</sup>

## 3 Definitions

For the purpose of this and other parts of ISO 8503, the definitions given in ISO 4618, together with the following, apply.

**3.1 surface profile :** The micro-roughness of a surface generally expressed as the height of the major peaks relative to the major valleys.

NOTE — This term is defined in ISO 4287-1 as “a line of intersection of a surface with a plane”. Characteristics of the roughness of blast-cleaned surfaces are defined in 3.7, 3.8, 3.10 to 3.12 and in ISO 8503-4.

**3.2 ISO surface profile comparator :** A planar plate of four segments on which are imparted reference surface profiles as defined in this International Standard.

NOTE — The reference surface profiles are prepared by forming, on a corrosion-resistant metal, positive replicas of an appropriately blast-cleaned mild steel coupon (3.3) (see clause 5).

**3.3 coupon :** A mild steel flat plate of four segments and of sufficient gauge that blast-cleaning will not cause distortion.

**3.4 surface profile comparator :** A specimen surface, or surface of known average profile, representing a particular abrasive blast-cleaning process.

NOTE — The comparator is used to give guidance on the appearance and feel of an abrasive blast-cleaned surface and to enable an assessment to be made of the profile of the surface. The term “roughness comparison specimen” (see ISO 2632-2) is preferred by ISO/TC 57, *Metallurgy and properties of surfaces.*

**3.5 grit comparator :** A comparator with surface profiles corresponding to (or simulating) surfaces obtained by abrasive blast-cleaning with metallic or mineral grit (Comparator G).

**3.6 shot comparator :** A comparator with surface profiles corresponding to (or simulating) surfaces obtained by abrasive blast-cleaning with metallic shot (Comparator S).

**3.7 maximum peak-to-valley height (by microscopy),  $h_v$  :** The vertical distance between the highest peak and the lowest valley in the field of view of a microscope (see ISO 8503-3).

NOTE —  $h_v$  is usually measured in micrometres.

**3.8 mean maximum peak-to-valley height (by microscopy),  $\bar{h}_v$  :** The arithmetic mean of a number of determinations (not less than 20) of  $h_v$  (3.7).

**3.9 sampling length,  $l$  :** (as defined in ISO 4287-1) : The length of the reference line used for identifying the irregularities characterizing the surface roughness.

1) At present at the stage of draft.