
**Preparation of steel substrates before
application of paints and related
products — Surface preparation
methods —**

**Part 4:
Acid pickling**

*Préparation des subjectiles d'acier avant application de peintures et
de produits assimilés — Méthodes de préparation des subjectiles —*

Partie 4: Décapage à l'acide



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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 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 of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document 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*.

A list of all parts in the ISO 8504 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.

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:

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

The ISO 8501 series, the ISO 8502 series and the ISO 8503 series provide methods for assessing these factors. The ISO 8504 series however provides guidance on the preparation methods that are available for cleaning steel substrates, indicating the capabilities of each in attaining the specified levels of cleanliness.

This document describes acid pickling, which is an effective method for surface preparation. It is widely applicable because this method of surface preparation has a number of versatile features listed below.

- a) In general, the equipment is stationary but can be mobile.
- b) The method is applicable to most types and forms of steel surface, especially those that would deform by abrasive blast-cleaning.
- c) It is possible to remove rust or mill scale and non-steel metal traces from internal, external and complex structures surfaces.
- d) Acid pickling can be performed for decorative and or aesthetic purposes.

There are several items that should be included in the purchaser's procurement documents to supplement this document. Surface imperfections should be considered before surface preparation and coating application. The ISO 8504 series does not contain recommendations for surface cleaning of equipment and cleaning of pipelines (such as chemical pipelines, petroleum pipelines).

The ISO 8504 series does not contain recommendations for the protective coating system to be applied to the steel surface. The ISO 8504 series does not contain recommendations on surface quality requirements for specific situations even though surface quality can have a direct influence on the choice of protective coating and on its performance. Such recommendations are found in other documents such as national standards and codes of practice. The ISO 8504 series is used to ensure that the specified qualities are:

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

Preparation of steel substrates before application of paints and related products — Surface preparation methods —

Part 4: Acid pickling

WARNING — The procedures described in this document are intended to be carried out by suitably trained and/or supervised personnel. The substances and procedures used in these methods may be injurious to health if adequate precautions are not taken. Attention is drawn in the text to certain specific hazards. This document refers only to the technical suitability of the methods and does not absolve the user from statutory obligations relating to health and safety.

1 Scope

This document describes the typical method for acid pickling generally used in a shop facility for the preparation of steel substrates before application of paints and related products. It is in general applicable to new steelwork.

This method is essentially intended to remove rust and mill scale. Typically, only slight oil residues can be removed during this process. It can be used on steel surfaces that are easily deformed by abrasive blasting.

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 8502 (all parts), *Preparation of steel substrates before application of paints and related products — Tests for the assessment of surface cleanliness*

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 acid pickling

treatment to remove rust and mill scale from steel substrates by means of an acidic solution usually containing an *inhibitor* (3.3)

3.2 pickling liquid

liquid mixed of an etching component (an organic acid, inorganic acid and / or complexing agent), an *inhibitor* (3.3) and generally a *surfactant* (3.4)