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

Part 2:

**Abrasive blast-cleaning**

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

*Partie 2: Décapage par projection d'abrasif*

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ISO copyright office  
CP 401 • Ch. de Blandonnet 8  
CH-1214 Vernier, Geneva  
Phone: +41 22 749 01 11  
Fax: +41 22 749 09 47  
Email: [copyright@iso.org](mailto:copyright@iso.org)  
Website: [www.iso.org](http://www.iso.org)

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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](http://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](http://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](http://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*.

This third edition cancels and replaces the second edition (ISO 8504-2:2000), which has been technically revised. The main changes compared to the previous edition are as follows:

- update of [Clause 2](#), normative references;
- editorial revision.

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](http://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, and
- the surface profile.

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

The ISO 8504 series is applicable to new and corroded steel surfaces and to steel surfaces that are uncoated or have been previously coated with paints and related products.

These International Standards do not contain provisions for the protective coating system to be applied to the steel surface. They do not contain provisions 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 provisions are found in other documents such as national standards and codes of practice. Users of these International Standards should ensure 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, and
- within the capability of the cleaning procedure specified.

The primary objective of surface preparation is to ensure the removal of deleterious matter and to obtain a surface that permits satisfactory adhesion of the priming paint to steel. It is also intended to assist in reducing the amounts of contaminants that initiate corrosion.

Abrasive blast-cleaning is a most effective method for mechanical surface preparation. It is widely applicable because this method of surface preparation has a number of versatile features listed below.

- The method allows a high production rate.
- The equipment can be stationary or mobile and is adaptable to the objects to be cleaned.
- The method is applicable to most types and forms of steel surface.
- Many different surface states can be produced, for example different preparation grades and surface profiles.
- Effects such as cleaning, peening, roughening, levelling and lapping can be produced.
- It is possible to remove selectively partly failed coatings, leaving sound coatings intact.
- Abrasive ricochet (rebound) enables the cleaning of otherwise inaccessible areas.

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

## Part 2: Abrasive blast-cleaning

### 1 Scope

This document specifies abrasive blast-cleaning methods for the preparation of steel surfaces before coating with paints and related products. It provides information on the effectiveness of the individual methods and their fields of application. It describes the equipment to use and the procedure to follow.

NOTE These methods are essentially intended for hot-rolled steel to remove mill scale, rust, etc. but could also be used for cold-rolled steel of sufficient thickness to withstand the deformation caused by the impact of abrasive.

### 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 4628-3, *Paints and varnishes — Evaluation of degradation of coatings — Designation of quantity and size of defects, and of intensity of uniform changes in appearance — Part 3: Assessment of degree of rusting*

ISO 8501 (all parts), *Preparation of steel substrates before application of paints and related products — Visual assessment of surface cleanliness*

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

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

ISO 11124 (all parts), *Preparation of steel substrates before application of paints and related products — Specifications for metallic blast-cleaning abrasives*

ISO 11126 (all parts), *Preparation of steel substrates before application of paints and related products — Specifications for non-metallic blast-cleaning abrasives*

### 3 Terms and definitions

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

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

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

#### 3.1

##### **abrasive blast-cleaning**

impingement of a high-kinetic-energy stream of abrasive onto the surface to be prepared

### 3.2

#### **blast-cleaning abrasive**

solid material intended to be used for *abrasive blast-cleaning* ([3.1](#))

### 3.3

#### **shot**

particle that is predominantly round, that has a length of less than twice the maximum particle width and that does not have edges, broken faces or other sharp surface defects

### 3.4

#### **grit**

particle that is predominantly angular, that has fractured faces and sharp edges and that is less than half-round in shape

### 3.5

#### **cylindrical**

particle that is sharp-edged, that has a diameter-to-length ratio of 1:1 and that is cut so that its faces are approximately at right angles to their centreline

## 4 Abrasives

### 4.1 Materials and types

**4.1.1** A wide variety of natural and synthetic solid materials are used for abrasive blast-cleaning. Solid materials commonly in use for the preparation of steel surfaces before coating are given in [Table 1](#). Each material provides a characteristic performance and surface finish.

When selecting a blast-cleaning abrasive, the following factors relating to its initial condition shall be taken into account:

- sub-group and type (see [Table 1](#));
- indication of chemical composition;
- range of particle size (see [4.1.2](#));
- particle hardness (for example Vickers, Rockwell or Mohs, or as measured by another appropriate method).

NOTE The ISO 11124 series, the ISO 11125 series, the ISO 11126 series and the ISO 11127 series are International Standards on metallic and non-metallic blast-cleaning abrasives.



4.1.2 The size and shape of the particles of an abrasive might change during use or re-use and this change can affect the resultant surface texture of the blast-cleaned steel.

**Table 1 — Commonly used blast-cleaning abrasives for steel substrate preparation**

Type			Abbreviation	Initial particle shape (see Table 2)	Comparator <sup>a</sup>	Remarks
Metallic (M) blast-cleaning abrasives <sup>c</sup>	Cast iron	Chilled	M/CI	G	G	Mainly for compressed-air blast-cleaning
		Cast steel	High-carbon	M/HCS	S or G	S <sup>b</sup> or G
	Low-carbon		M/LCS	S	S	
	Cut steel wire	—	M/CW	C	S <sup>b</sup>	
Non-metallic (N) blast-cleaning abrasives <sup>c</sup>	Natural	Olivine	N/OL	G	G	Mainly for compressed-air blast-cleaning
		Staurolite	N/ST	S	G	
		Almandite garnet	N/GA	G	G	
	Synthetic	Iron slag (Calcium silicate)	N/FE1	G	G	Mainly for compressed-air blast-cleaning
			N/FE2	G/S		
		Copper refinery slag (Iron silicate)	N/GU	G/S		
			N/NI1	G		
		Ferronickel slag (Magnesium silicate)	N/NI2	G/S		
		Coal furnace slag (Aluminium silicate)	N/CS	G		
		Fused aluminium oxide	N/FA	G	G	

**Key**

M: Metallic blast-cleaning abrasives

N: Non-metallic blast-cleaning abrasives

<sup>a</sup> Comparator to be used when assessing the resultant surface profile. The method for evaluating the surface profile by comparator is described in ISO 8503-2.

<sup>b</sup> Certain types of abrasive rapidly change their shape when used, depending on hardness. As soon as this happens, the appearance of the surface profile changes and becomes closer to that of the "shot" comparator.

<sup>c</sup> International Standards for the range of abrasives given here are the ISO 11124 series for metallic blast-cleaning abrasives, and the ISO 11126 series for non-metallic blast-cleaning abrasives.

**Table 2 — Initial particle shape**

Designation and initial particle shape	Abbreviation
Shot — round	S
Grit — angular, irregular	G
Cylindrical — sharp-edged	C