

INTERNATIONAL  
STANDARD

**ISO**  
**11124-1**

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**Preparation of steel substrates before  
application of paints and related  
products — Specifications for metallic  
blast-cleaning abrasives —**

**Part 1:**  
General introduction and classification

*Préparation des subjectiles d'acier avant application de peintures et de  
produits assimilés — Spécifications pour abrasifs métalliques destinés à  
la préparation par projection —*

*Partie 1: Introduction générale et classification*



Reference number  
ISO 11124-1:1993(E)

## 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.

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.

International Standard ISO 11124-1 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*.

ISO 11124 consists of the following parts, under the general title *Preparation of steel substrates before application of paints and related products* — *Specifications for metallic blast-cleaning abrasives*:

- Part 1: *General introduction and classification*
- Part 2: *Chilled-iron grit*
- Part 3: *High-carbon cast-steel shot and grit*
- Part 4: *Low-carbon cast-steel shot*
- Part 5: *Cut steel wire*

At the time of publication of this part of ISO 11124, part 5 was in course of preparation.

Annex A of this part of ISO 11124 is for information only.

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## Introduction

This is one of a number of parts of ISO 11124 specifying requirements for metallic abrasives for blast-cleaning.

**Test methods for metallic blast-cleaning abrasives are given in the various parts of ISO 11125 (see annex A).**

The requirements for non-metallic abrasives commonly used for blast-cleaning are specified in the various parts of ISO 11126. Test methods to be used to define these requirements are contained in the various parts of ISO 11127 (see annex A).

Abrasive blast-cleaning techniques are widely used to clean and prepare surfaces. During work on development of a series of International Standards dealing with the preparation of steel substrates before application of paints and related products, it was decided that a need existed for a series of International Standards covering those blast-cleaning abrasives commonly used in preparation of steelwork.

The type of blast-cleaning abrasive used and its particle shape can significantly affect the surface appearance and profile form of the treated surface.

The informative supplement to ISO 8501-1<sup>1)</sup> provides photographic examples of the change in appearance imparted to steel when blast-cleaned with different abrasive types.

ISO 8503-2<sup>2)</sup> describes the assessment of the surface roughness of prepared surfaces using comparators. Table 1 of this part of ISO 11124 identifies the type of comparator to be used with each of the blast-cleaning abrasives considered.

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1) ISO 8501-1:1988/Suppl, *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 — Informative Supplement to part 1: Representative photographic examples of the change of appearance imparted to steel when blast-cleaned with different abrasives.* (To be published.)

2) ISO 8503-2:1988, *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.*

# Preparation of steel substrates before application of paints and related products — Specifications for metallic blast-cleaning abrasives —

## Part 1:

### General introduction and classification

**WARNING** — Equipment, materials and abrasives used for surface preparation can be hazardous if used carelessly. Many national regulations exist for those materials and abrasives that are considered to be hazardous during or after use (waste management), such as free silica or carcinogenic or toxic substances. These regulations are therefore to be observed. It is important to ensure that adequate instructions are given and that all required precautions are exercised.

## 1 Scope

This part of ISO 11124 describes a classification of metallic blast-cleaning abrasives for the preparation of steel substrates before application of paints and related products.

It specifies the characteristics which are required for the complete designation of such abrasives.

This part of ISO 11124 applies to abrasives supplied in the “new” or unused condition only. It does not apply to abrasives either during or after use.

**NOTE 1** Although this part of ISO 11124 has been developed specifically to meet requirements for preparation of steelwork, the properties specified will generally be appropriate for use when preparing other material surfaces, or components, using blast-cleaning techniques. These techniques are described in ISO 8504-2:1992, *Preparation of steel substrates before application of paints and related products — Surface preparation methods — Part 2: Abrasive blast-cleaning*.

## 2 Definitions

For the purposes of this part of ISO 11124, the following definitions apply.

**2.1 blast-cleaning abrasive:** Solid material intended to be used for abrasive blast-cleaning.

**2.2 abrasive blast-cleaning:** Impingement of a high-kinetic-energy stream of blast-cleaning abrasive on to the surface to be prepared.

**2.3 shot:** Particles that are predominantly round, that have a length of less than twice the maximum particle width and that do not have edges, broken faces or other sharp surface defects.

**2.4 grit:** Particles that are predominantly angular, that have fractured faces and sharp edges and that are less than half-round in shape.

**2.5 cylindrical:** Sharp-edged particles, having a diameter to length ratio of 1:1, cut so that their faces are approximately at right angles to their centreline.

**Table 1 — Commonly used metallic (M) blast-cleaning abrasives for steel substrate preparation**

Type			Abbreviation	Initial particle shape (see 3.2)	Comparator <sup>1)</sup>
Metallic (M) blast-cleaning abrasives	Cast iron	Chilled	M/CI	G	G
	Cast steel	High-carbon	M/HCS	S or G	S <sup>2)</sup>
		Low-carbon	M/LCS	S	S
	Cut steel wire	—	M/CW	C	S <sup>2)</sup>

1) Comparator to be used when assessing the resultant surface profile. The method for evaluating surface profile by comparator is described in ISO 8503-2 (see the introduction).

2) Certain types of abrasive rapidly change their shape when used. As soon as this happens the appearance of the profile changes and becomes more similar to that of the "shot" comparator.

### 3 Classification

#### 3.1 Abrasive type

Blast-cleaning abrasives shall be classified according to material, origin or manufacture. Table 1 gives the abbreviated coding which shall be used to identify each of the types considered.

NOTE 2 The metallic abrasives listed in table 1 are those commonly used for the preparation of steel substrates before application of paints and related products. The list is not intended to be exhaustive.

#### 3.2 Initial particle shape

The particle shape characterizes the geometric form of the abrasive particles. Basic forms of metallic blast-cleaning abrasives are specified in table 2, together with the symbol which shall be used to describe each.

NOTE 3 As the particle shape of an abrasive may change during use, only the initial particle shape is given in the various parts of ISO 11124.

**Table 2 — Initial particle shape**

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

#### 3.3 Particle size range

Metallic blast-cleaning abrasives consist of mixtures of differently sized particles. These shall be classified

into size ranges or grades. A 3-digit number shall be used to indicate each particular size range or grade. This number indicates the nominal or approximate midpoint of the size range in millimetres  $\times 100$ .

#### EXAMPLE 1

##### Grade 200

Approximate middle of the particle size range or nominal diameter of the grade	2,00 mm	
Particle size range	over 2,36 mm	Nil
	over 1,70 mm	> 80 %

### 4 Designation of abrasives

Metallic abrasives shall be identified by using the full product designation which consists of the term "Abrasive" followed by "ISO 11124" and the abbreviation specified in table 1. This shall be followed, without spaces, by an oblique stroke and then by the symbol specified in table 2 to indicate the required particle shape of the abrasive as purchased. The designation shall be completed, again without a space, by a 3-digit number denoting the grade, or nominal particle size, required. If alternative hardnesses of abrasive are available, the particular Vickers hardness (HV) range required shall also be specified.

#### EXAMPLES

##### 2 Abrasive ISO 11124 M/CI/G100

denotes an abrasive of the metallic, chilled-iron type, complying with the requirements of the appropriate part of ISO 11124, of initial particle

shape grit and of grade 100 (i.e. nominal particle size 1,00 mm).

### 3 Abrasive ISO 11124 M/HCS/G140/570-710HV

denotes an abrasive of the metallic, high-carbon cast-steel type, complying with the requirements of the appropriate part of ISO 11124, of initial particle shape grit and of grade 140 (i.e. nominal particle size 1,40 mm), and with a hardness range of 570 HV to 710 HV.

It is essential that this full product designation is quoted on all orders.

## 5 Package identification and lot traceability

All supplies shall be clearly marked and identified using the appropriate designation as specified in clause 4. The unit of sale, i.e. pallet, drum, box, etc., shall be clearly labelled with the full product coding, including hardness range, if applicable.

Sub-units, i.e. bags, shall be marked with the particle shape and grade codes.

NOTE 4 Inclusion of additional marking to allow product traceability to a particular production period or lot is strongly recommended. Traceability references should be included at least at the pallet, drum or box level of package marking.

## Annex A (informative)

### International Standards for metallic and non-metallic blast-cleaning abrasives

**A.1** Requirements and test methods for metallic blast-cleaning abrasives are contained in ISO 11124 and ISO 11125, respectively.

ISO 11124 will consist of the following parts, under the general title:

*Preparation of steel substrates before application of paints and related products — Specification for metallic blast-cleaning abrasives*

- *Part 1: General introduction and classification*
- *Part 2: Chilled-iron grit*
- *Part 3: High-carbon cast-steel shot and grit*
- *Part 4: Low-carbon cast-steel shot*
- *Part 5: Cut steel wire*

ISO 11125 will consist of the following parts, under the general title:

*Preparation of steel substrates before application of paints and related products — Test methods for metallic blast-cleaning abrasives*

- *Part 1: Sampling*
- *Part 2: Determination of particle size distribution*
- *Part 3: Determination of hardness*
- *Part 4: Determination of apparent density*
- *Part 5: Determination of percentage defective particles and of microstructure*
- *Part 6: Determination of foreign matter*
- *Part 7: Determination of moisture*

- *Part 8: Determination of abrasive mechanical properties*

**A.2** Requirements and test methods for non-metallic blast-cleaning abrasives are contained in ISO 11126 and ISO 11127, respectively.

ISO 11126 will consist of the following parts, under the general title:

*Preparation of steel substrates before application of paints and related products — Specifications for non-metallic blast-cleaning abrasives*

- *Part 1: General introduction and classification*
- *Part 2: Silica sand*
- *Part 3: Copper refinery slag*
- *Part 4: Coal furnace slag*
- *Part 5: Nickel refinery slag*
- *Part 6: Iron furnace slag*
- *Part 7: Fused aluminium oxide*
- *Part 8: Olivine sand*
- *Part 9: Staurolite*
- *Part 10: Garnet*

ISO 11127 will consist of the following parts, under the general title:

*Preparation of steel substrates before application of paints and related products — Test methods for non-metallic blast-cleaning abrasives*

- *Part 1: Sampling*

- *Part 2: Determination of particle size distribution*
- *Part 3: Determination of apparent density*
- *Part 4: Assessment of hardness by a glass slide test*
- *Part 5: Determination of moisture*
- *Part 6: Determination of water-soluble contaminants by conductivity measurement*
- *Part 7: Determination of water-soluble chlorides*
- *Part 8: Determination of abrasive mechanical properties*



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**Descriptors:** paints, varnishes, substrates, steel products, blast-cleaning, abrasives, metallic abrasives, classification, specifications, particle size, designation.

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