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Non-metallic blast-cleaning abrasives

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Foreword

This translation has been made based on the original Japanese Industrial Standard revised by the Minister of Economy, Trade and Industry through deliberations at the Japanese Industrial Standards Committee, as the result of proposal for revision of Japanese Industrial Standard submitted by Japan Association of Corrosion Control (JACC)/Japanese Standards Association (JSA) with the draft being attached, based on the provision of Article 12 Clause 1 of the Industrial Standardization Law applicable to the case of revision by the provision of Article 14. Consequently JIS Z 0312 : 1996 is replaced with this Standard.

This revision has been made based on ISO 11126-1 : 1997 *Preparation of steel substrates before application of paints and related products—Specifications for non-metallic blast-cleaning abrasives—Part 1 : General introduction and classification*, ISO 11126-3 : 1993 *Preparation of steel substrates before application of paints and related products—Specifications for non-metallic blast-cleaning abrasives—Part 3 : Copper refinery slag*, ISO 11126-4 : 1993 *Preparation of steel substrates before application of paints and related products—Specifications for non-metallic blast-cleaning abrasives—Part 4 : Coal furnace slag*, ISO 11126-5 : 1993 *Preparation of steel substrates before application of paints and related products—Specifications for non-metallic blast-cleaning abrasives—Part 5 : Nickel refinery slag*, ISO 11126-6 : 1993 *Preparation of steel substrates before application of paints and related products—Specifications for non-metallic blast-cleaning abrasives—Part 6 : Iron furnace slag*, ISO 11126-7 : 1999 *Preparation of steel substrates before application of paints and related products—Specifications for non-metallic blast-cleaning abrasives—Part 7 : Fused aluminium oxide*, ISO 11126-8 : 1993 *Preparation of steel substrates before application of paints and related products—Specifications for non-metallic blast-cleaning abrasives—Part 8 : Olivine sand*, ISO 11126-9 : 1999 *Preparation of steel substrates before application of paints and related products—Specifications for non-metallic blast-cleaning abrasives—Part 9 : Staurolite*, ISO 11126-10 : 2000 *Preparation of steel substrates before application of paints and related products—Specifications for non-metallic blast-cleaning abrasives—Part 10 : Almandite garnet*, ISO 11127-1 : 1993 *Preparation of steel substrates before application of paints and related products—Test methods for non-metallic blast-cleaning abrasives—Part 1 : Sampling*, ISO 11127-2 : 1993 *Preparation of steel substrates before application of paints and related products—Test methods for non-metallic blast-cleaning abrasives—Part 2 : Determination of particle size distribution*, ISO 11127-3 : 1993 *Preparation of steel substrates before application of paints and related products—Test methods for non-metallic blast-cleaning abrasives—Part 3 : Determination of apparent density*, ISO 11127-4 : 1993 *Preparation of steel substrates before application of paints and related products—Test methods for non-metallic blast-cleaning abrasives—Part 4 : Assessment of hardness by a glass slide test*, ISO 11127-5 : 1993 *Preparation of steel substrates before application of paints and related products—Test methods for non-metallic blast-cleaning abrasives—Part 5 : Determination of moisture*, ISO 11127-6 : 1993 *Preparation of steel substrates before application of paints and related products—Test methods for non-metallic blast-cleaning abrasives—Part 6 : Determination of water-soluble contaminants by conductivity measurement* and ISO 11127-7 : 1993 *Preparation of steel substrates before application of paints and related products—Test methods for non-metallic blast-cleaning abrasives—Part 7 : Determination of water-soluble chlorides for the purposes of making it easier to compare this Standard with International Standards*; to prepare Japanese Industrial Standard conforming with International Standards; and to propose a draft of an International Standard which is based on Japanese Industrial Standard.

Attention is drawn to the possibility that some parts of this Standard may conflict with a patent right, application for a patent after opening to the public, utility model right or application for registration of utility model after opening to the public which have technical properties. The relevant Minister and the Japanese Industrial Standards Committee are not responsible for identifying the patent right, application for a patent after opening to the public, utility model right or application for registration of utility model after opening to the public which have the said technical properties.

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Non-metallic blast-cleaning abrasives

Introduction This Japanese Industrial Standard has been prepared based on each first edition of **ISO 11126-1** : 1997 *Preparation of steel substrates before application of paints and related products—Specifications for non-metallic blast-cleaning abrasives—Part 1 : General introduction and classification*, **ISO 11126-3** : 1993 *Preparation of steel substrates before application of paints and related products—Specifications for non-metallic blast-cleaning abrasives—Part 3 : Copper refinery slag*, **ISO 11126-4** : 1993 *Preparation of steel substrates before application of paints and related products—Specifications for non-metallic blast-cleaning abrasives—Part 4 : Coal furnace slag*, **ISO 11126-5** : 1993 *Preparation of steel substrates before application of paints and related products—Specifications for non-metallic blast-cleaning abrasives—Part 5 : Nickel refinery slag*, **ISO 11126-6** : 1993 *Preparation of steel substrates before application of paints and related products—Specifications for non-metallic blast-cleaning abrasives—Part 6 : Iron furnace slag*, **ISO 11126-7** : 1999 *Preparation of steel substrates before application of paints and related products—Specifications for non-metallic blast-cleaning abrasives—Part 7 : Fused aluminium oxide*, **ISO 11126-8** : 1993 *Preparation of steel substrates before application of paints and related products—Specifications for non-metallic blast-cleaning abrasives—Part 8 : Olivine sand*, **ISO 11126-9** : 1999 *Preparation of steel substrates before application of paints and related products—Specifications for non-metallic blast-cleaning abrasives—Part 9 : Staurolite*, **ISO 11126-10** : 2000 *Preparation of steel substrates before application of paints and related products—Specifications for non-metallic blast-cleaning abrasives—Part 10 : Almandite garnet*, **ISO 11127-1** : 1993 *Preparation of steel substrates before application of paints and related products—Test methods for non-metallic blast-cleaning abrasives—Part 1 : Sampling*, **ISO 11127-2** : 1993 *Preparation of steel substrates before application of paints and related products—Test methods for non-metallic blast-cleaning abrasives—Part 2 : Determination of particle size distribution*, **ISO 11127-3** : 1993 *Preparation of steel substrates before application of paints and related products—Test methods for non-metallic blast-cleaning abrasives—Part 3 : Determination of apparent density*, **ISO 11127-4** : 1993 *Preparation of steel substrates before application of paints and related products—Test methods for non-metallic blast-cleaning abrasives—Part 4 : Assessment of hardness by a glass slide test*, **ISO 11127-5** : 1993 *Preparation of steel substrates before application of paints and related products—Test methods for non-metallic blast-cleaning abrasives—Part 5 : Determination of moisture*, **ISO 11127-6** : 1993 *Preparation of steel substrates before application of paints and related products—Test methods for non-metallic blast-cleaning abrasives—Part 6 : Determination of water-soluble contaminants by conductivity measurement* and **ISO 11127-7** : 1993 *Preparation of steel substrates before application of paints and related products—Test methods for non-metallic blast-cleaning abrasives—Part 7 : Determination of water-soluble chlorides with some modifications of the technical contents*.

Portions with sidelines or underlined with dots are the matters modified from the original International Standards. The list of modifications with their explanations is given in annex 2 (informative).

1 Scope This Standard specifies the non-metallic abrasives (hereafter referred to as “abrasives”) used for blasting which is carried out as surface preparation before applying paints or related products to steel products for the corrosion prevention and rust prevention.

Remarks : The International Standards corresponding to this Standard are as follows.

In addition, symbols which denote the degree of correspondence in the contents between the relevant International Standards and **JIS** are IDT (identical), MOD (modified), and NEQ (not equivalent) according to **ISO/IEC Guide 21**.

ISO 11126-1 : 1997 *Preparation of steel substrates before application of paints and related products—Specifications for non-metallic blast-cleaning abrasives—Part 1 : General introduction and classification* (MOD)

ISO 11126-3 : 1993 *Preparation of steel substrates before application of paints and related products—Specifications for non-metallic blast-cleaning abrasives—Part 3 : Copper refinery slag* (MOD)

ISO 11126-4 : 1993 *Preparation of steel substrates before application of paints and related products—Specifications for non-metallic blast-cleaning abrasives—Part 4 : Coal furnace slag* (MOD)

ISO 11126-5 : 1993 *Preparation of steel substrates before application of paints and related products—Specifications for non-metallic blast-cleaning abrasives—Part 5 : Nickel refinery slag* (MOD)

ISO 11126-6 : 1993 *Preparation of steel substrates before application of paints and related products—Specifications for non-metallic blast-cleaning abrasives—Part 6 : Iron furnace slag* (MOD)

ISO 11126-7 : 1999 *Preparation of steel substrates before application of paints and related products—Specifications for non-metallic blast-cleaning abrasives—Part 7 : Fused aluminium oxide* (MOD)

ISO 11126-8 : 1993 *Preparation of steel substrates before application of paints and related products—Specifications for non-metallic blast-cleaning abrasives—Part 8 : Olivine sand* (MOD)

ISO 11126-9 : 1999 *Preparation of steel substrates before application of paints and related products—Specifications for non-metallic blast-cleaning abrasives—Part 9 : Staurolite* (MOD)

ISO 11126-10 : 2000 *Preparation of steel substrates before application of paints and related products—Specifications for non-metallic blast-cleaning abrasives—Part 10 : Almandite garnet* (MOD)

ISO 11127-1 : 1993 *Preparation of steel substrates before application of paints and related products—Test methods for non-metallic blast-cleaning abrasives—Part 1 : Sampling* (MOD)

ISO 11127-2 : 1993 *Preparation of steel substrates before application of paints and related products—Test methods for non-metallic blast-cleaning abrasives—Part 2 : Determination of particle size distribution* (MOD)

- ISO 11127-3 : 1993 *Preparation of steel substrates before application of paints and related products—Test methods for non-metallic blast-cleaning abrasives—Part 3 : Determination of apparent density (MOD)*
- ISO 11127-4 : 1993 *Preparation of steel substrates before application of paints and related products—Test methods for non-metallic blast-cleaning abrasives—Part 4: Assessment of hardness by a glass slide test (MOD)*
- ISO 11127-5 : 1993 *Preparation of steel substrates before application of paints and related products—Test methods for non-metallic blast-cleaning abrasives—Part 5 : Determination of moisture (MOD)*
- ISO 11127-6 : 1993 *Preparation of steel substrates before application of paints and related products—Test methods for non-metallic blast-cleaning abrasives—Part 6 : Determination of water-soluble contaminants by conductivity measurement (MOD)*
- ISO 11127-7 : 1993 *Preparation of steel substrates before application of paints and related products—Test methods for non-metallic blast-cleaning abrasives—Part 7 : Determination of water-soluble chlorides (MOD)*

2 Normative references The following standards contain provisions which, through reference in this Standard, constitute provisions of this Standard. The most recent editions of the standards (including amendments) indicated below shall be applied.

JIS K 0050	<i>General rules for chemical analysis</i>
JIS K 0101	<i>Testing methods for industrial water</i>
JIS R 3503	<i>Glass apparatus for chemical analysis</i>
JIS R 3505	<i>Volumetric glassware</i>
JIS R 3703	<i>Slide glasses for microscope</i>
JIS R 6003	<i>Method for sampling of abrasive grains</i>
JIS Z 0103	<i>Glossary of terms used in rust and corrosion preventive technology</i>
JIS Z 0310	<i>Abrasive blast-cleaning methods for surface preparation</i>
JIS Z 0311	<i>Metallic blast-cleaning abrasives</i>
JIS Z 8401	<i>Guide to the rounding of numbers</i>
JIS Z 8402-1	<i>Accuracy (trueness and precision) of measurement methods and results—Part 1 : General principles and definitions</i>
JIS Z 8801-1	<i>Test sieves—Part 1 : Test sieves of metal wire cloth</i>
JIS Z 8815	<i>Test sieving—General requirements</i>

3 Definitions For the purposes of this Standard, the definitions given in **JIS Z 0103**, **JIS Z 0310** and the following definitions shall apply.

- a) **grit** Particles that are predominantly angular, that have fractured faces and sharp edges and that are less than half-round in shape in the state before use.

- b) **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 in the state before use.
- c) **silica sand** Grit-shaped blast-cleaning abrasives composed of natural silica sands containing not less than 90 % of silicic acid component or particles obtained by crushing rocks.
- d) **olivine sand** Grit-shaped blast-cleaning abrasives obtained by crushing natural olivine ($\text{MgO} \cdot \text{SiO}_2 \cdot \text{Fe}_2\text{O}_3$).
- e) **almandite garnet** Grit-shaped blast-cleaning abrasives manufactured by crushing natural iron pan garnet [$\text{Fe}_3\text{Al}_2(\text{SiO}_4)_3$].
- f) **staurolite** Shot-shaped blast-cleaning abrasives composed of natural staurolite (mostly $\text{FeAl}_5\text{SiO}_{12}\text{OH}$).
- g) **fused aluminium oxide** Grit-shaped blast-cleaning abrasives obtained in such a manner that fused bauxite or high purity aluminium is cooled and then crushed. The alumina which is produced by fusing bauxite is called regular brawn alumina (containing alumina component of 94 wt% to 97 wt%), and the alumina which is produced by fusing high purity aluminium is called high purity alumina (containing alumina component of not less than 99 wt%).
- h) **copper refinery slag** Grit-shaped blast-cleaning abrasives manufactured by granulation in water from slags composed of iron oxide—silicic acid component originating when refining copper.
- i) **nickel refinery slag** Grit-shaped blast-cleaning abrasives manufactured by granulation in water from slags composed of iron oxide—silicic acid component originating when refining nickel.
- j) **ferronickel refinery slag** Grit-shaped blast-cleaning abrasives manufactured by granulation in water or by granulation in air from slags composed of silicic acid—magnesia—iron oxide component originating when refining ferronickel.
- k) **ferrochrome slag** Shot-shaped blast-cleaning abrasives manufactured by granulation in air from slags composed of magnesia—alumina—silicic acid component originating when refining ferrochrome.
- l) **iron furnace slag** Grit-shaped blast-cleaning abrasives manufactured by granulation in water from slags composed of lime—silicic acid component originating when smelting iron.
- m) **steel furnace slag** Shot-shaped blast-cleaning abrasives manufactured by granulation in air from slags composed of lime—iron oxide component originating when smelting steel.
- n) **coal furnace slag** Grit-shaped blast-cleaning abrasives manufactured by granulation in water from combustion ashes composed of alumina—silicic acid component originating when coal is burned in boiler.

- o) **apparent density** An average density of the whole particles including the cavity portion as a defect which exists in the inside of abrasive particles (of which opening is not opened on the surface) or the heterogeneous section.
- p) **Mohs hardness** Hardness assessed as a result of a procedure that, as an easier method introduced in field measurement instead of the Mohs hardness measuring method carried out in general, a slide glass for microscope specified in **JIS R 3703** is rubbed with an abrasive and observed whether the glass is scratched. If it is scratched, it is defined that Mohs hardness is 6 or over.
- q) **free moisture** A moisture adhering to the surface of abrasive powder. Water of crystallization is not included.
- r) **total quantity** The overall quantity of the abrasive to be tested (for example, the quantity of a consignment) for which the sampling procedure is to be considered as representative.
- s) **sample unit** The packaged unit of sale, e.g. bulk sack, drum, from which single samples are taken.
- t) **single sample** A sample obtained from the total quantity by a single sampling operation. This sample is not immediately used for testing.
- u) **mixed sample** A sample obtained by mixing a number of single samples.
- v) **reduced sample** A sample obtained by reduction of a mixed sample.
- w) **test sample** A reduced sample that comprises a mass or volume sufficient for testing, portions of which are immediately used for testing.

4 Classification The classification of abrasives shall be as given in table 1.

Table 1 Classification, shape and symbol

Classification	Abbreviation of shape	Symbol
Silica sand ⁽¹⁾	G	N/SI
Olivine sand	G	N/OL
Staurolite	S	N/ST
Almandite garnet	G	N/GA
Iron furnace slag	G	N/FE
Copper refinery slag	G	N/CU
Nickel refinery slag	G	N/NI
Coal furnace slag	G	N/CS
Fused alumina	G	N/FA
Regular brawn alumina	G	N/FA/A
High purity alumina	G	N/FA/WA
Ferronickel refinery slag	G	N/FN
Ferrochrome refinery slag	S	N/FC
Steel furnace slag	S	N/SS

Note ⁽¹⁾ Silica sand shall be excluded from the scope of this Standard as of April 1, 2007.

Remarks : Abbreviation of shape G indicates a grit shape, and S indicates a shot shape.

5 Quality The quality shall be as given in table 2 when testing in accordance with clauses 6 and 7.

Remarks : Abrasives shall not exceed the regulated value provided in Industrial Safety and Health Law, and industrial waste disposal related laws and regulations.