



SLOVENSKI STANDARD

SIST EN 13438:2006

01-april-2006

Barve in laki – Praškasti organski premazi za izdelke iz galvaniziranega ali difuzijsko pocinkanega jekla v gradbeništvu

Paints and varnishes - Powder organic coatings for galvanized or sherardised steel products for construction purposes

Beschichtungsstoffe - Pulverbeschichtungen für verzinkte oder sherardisierte Stahlerzeugnisse für Bauzwecke

Peintures et vernis - Revêtements de poudre organique pour produits en acier galvanisé ou shérardisé utilisés dans la construction

Ta slovenski standard je istoveten z: **EN 13438:2005**

ICS:

25.220.60	Organske prevleke	Organic coatings
87.040	Barve in laki	Paints and varnishes

SIST EN 13438:2006

en

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EUROPEAN STANDARD

EN 13438

NORME EUROPÉENNE

EUROPÄISCHE NORM

November 2005

ICS 25.220.60

English Version

Paints and varnishes - Powder organic coatings for galvanized or sherardised steel products for construction purposes

Peintures et vernis - Revêtements de poudre organique pour produits en acier galvanisé ou shérardisé utilisés dans la construction

Beschichtungsstoffe - Pulverbeschichtungen für feuerverzinkte oder shérardisierte Stahlerzeugnisse für Bauzwecke

This European Standard was approved by CEN on 8 September 2005.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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Foreword

This European Standard (EN 13438:2005) has been prepared by Technical Committee CEN/TC 139 "Paints and varnishes", the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by May 2006, and conflicting national standards shall be withdrawn at the latest by May 2006.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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Introduction

This European Standard has been produced as a result of the growing demand for products made of powder coated hot-dip galvanized or sherardised steel. These products offer a combination of corrosion resistance and decorative appearance.

It is assumed in the drafting of this standard that the specified test methods will be applied by those who are suitably trained and supervised.

This European Standard has been written from a coating performance perspective and does not seek to set out one method of powder coating galvanized or sherardised steel products. In order to facilitate production of the best quality powder coated hot dip galvanized or sherardised articles however, experience has shown that it is important that sufficient dialogue between the client, specifier, designer, fabricator, galvanizer or sherardiser and powder coating applicator takes place at the earliest stages of the project and that where possible timescales set out for processing of the work are practical and adhered to. A guidance document dealing with these and other aspects of supply is currently under development.

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1 Scope

This European Standard specifies performance requirements for powder coatings applied to galvanized or sherardised steel products, for architectural (internal and external application), fencing and construction purposes. Galvanized steel products can be articles batch hot dip galvanized (galvanized after fabrication) or articles consisting of continuously hot-dip galvanized sheet which is then subsequently fabricated. This standard does not apply to articles with zinc-aluminium coatings or aluminium-zinc coatings, or to continuously hot dip galvanized wire. Requirements for cleaning and pre-treatment of the galvanized or sherardised steel products prior to powder coating are also specified.

2 Normative references

The following referenced documents are indispensable for the application 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.

EN 10326, *Continuously hot-dip coated strip and sheet of structural steels — Technical delivery conditions*

EN 10327, *Continuously hot-dip coated strip and sheet of low carbon steels for cold forming — Technical delivery conditions*

EN 13811, *Sherardising — Zinc diffusion coatings on ferrous products — Specification*

EN ISO 1461, *Hot dip galvanized coatings on fabricated iron and steel articles — Specifications and test methods (ISO 1461:1999)*

EN ISO 1518, *Paints and varnishes — Scratch test (ISO 1518:1992)*

EN ISO 1519, *Paints and varnishes — Bend test (cylindrical mandrel) (ISO 1519:2002)*

EN ISO 2178, *Non-magnetic coatings on magnetic substrates — Measurement of coating thickness — Magnetic method (ISO 2178:1982)*

EN ISO 2409, *Paints and varnishes — Cross-cut test (ISO 2409:1992)*

EN ISO 2808, *Paints and varnishes — Determination of film thickness (ISO 2808:1997)*

EN ISO 2810, *Paints and varnishes - Natural weathering of coatings - Exposure and assessment (ISO 2810:2004)*

EN ISO 2813, *Paints and varnishes - Determination of specular gloss of non-metallic paint films at 20°, 60° and 85° (ISO 2813:1994, including Technical Corrigendum 1:1997)*

EN ISO 3231, *Paints and varnishes — Determination of resistance to humid atmospheres containing sulfur dioxide (ISO 3231:1993)*

EN ISO 3668, *Paints and varnishes — Visual comparison of the colour of paints (ISO 3668:1998)*

EN ISO 6270-1, *Paints and varnishes — Determination of resistance to humidity — Part 1: Continuous condensation (ISO 6270-1:1998)*

EN ISO 7253, *Paints and varnishes — Determination of resistance to neutral salt spray (fog) (ISO 7253:1996)*

EN ISO 8130-9, *Coating powders — Part 9: Sampling (ISO 8130-9:1992)*

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EN ISO 11341:2004, *Paints and varnishes - Artificial weathering and exposure to artificial radiation - Exposure to filtered xenon-arc radiation (ISO 11341:2004)*

ISO 7724-3, *Paints and varnishes — Colorimetry — Part 3: Calculation of colour differences*

ISO 9227, *Corrosion tests in artificial atmospheres - Salt spray tests*

ISO 10474, *Steel and steel products — Inspection documents*

3 Terms and definitions

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

3.1**finishing coat**

final coat of a coating system

[EN 971-1:1996]

3.2**conversion coating**

layer produced on a galvanized or sherardised steel surface by a chemical treatment

3.3**powder coating**

dry film obtained by application and fusing of a coating powder

3.4**coating powder**

solvent-free coating material in powder form which, after fusing and possible curing, gives a continuous film

3.5**test piece**

single item, representative of the work being processed

3.6**test sample**

group of test pieces

3.7**significant surface**

that part of the coated article on which the coating is essential for serviceability of the article

3.8**specifier**

person specifying the performance requirements for the coating and significant surfaces of the article

3.9**coating applicator**

company responsible for applying the coating powder onto a substrate

4 Substrate material

The substrate shall be hot dip galvanized steel in accordance with EN ISO 1461, EN 10326, EN 10327 or sherardised steel in accordance with EN 13811. If required, steel sections shall be free from surface imperfections such as die lines and laminations. Unless otherwise agreed, the preparation of the surface of

the galvanized article, such that the surface is suitable for pre-treatment and application of powder to the surface, shall be the responsibility of the coating applicator (see 3.9).

NOTE 1 The galvanizer or the sherardiser and coating applicator should be consulted about the design of the steel products intended for galvanizing or sherardising after construction, prior to the fabrication stage, in order to optimise galvanizing and powder coating quality. EN ISO 12944-4 provides some guidance on surface conditions that might be encountered on post fabrication hot dip galvanized or sherardised articles.

NOTE 2 To achieve optimum quality of finished product sharp edges on the fabrication should be avoided.

5 Coating powder

5.1 Identification

The following information shall be made available by the supplier for each consignment of coating powder:

- a) manufacturer;
- b) trade name;
- c) colour;
- d) gloss level;
- e) type of resin;
- f) batch number;
- g) box number;
- h) product reference code;
- i) date of manufacture;
- j) date of despatch.

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5.2 Storage

The coating powder, after storage in unopened containers for a maximum period indicated by the manufacturer, calculated from the date of dispatch by the manufacturer, shall still conform to 5.3. If no maximum permissible storage period is indicated by the manufacturer, the coating powder shall, after storage in unopened containers for up to 12 months from the date of despatch by the manufacturer, conform to 5.3.

The storage temperature shall not exceed 25 °C unless otherwise specified by the coating powder manufacturer.

Coating powder that has been stored for longer than the maximum permissible period indicated by the manufacturer (or if no maximum permissible storage period has been indicated and the coating powder has been stored for longer than 12 months) shall only be used upon agreement between the manufacturer and the coating applicator.

EN 13438:2005 (E)

5.3 Performance requirements

5.3.1 General

The following tests (5.3.2. to 5.3.12) shall be carried out in accordance with Annex A by the manufacturer of the coating powder.

The coating powder, when applied to a prepared test panel in accordance with Annex A shall show no scratches through to the substrate. When a coated test panel is examined in accordance with A.4.1, no blisters, craters, pinholes or scratches shall be first visible from a distance of 1 m.

The manufacturer of the coating powder shall identify, with reference to Class 1 or Class 2, the performance capability of powder supplied, dependent upon the results of testing set out in 5.3.12.

5.3.2 Colour

When a coated test panel is examined in accordance with A.4.2, the colour of the coating shall match the reference colour or fall within the tolerance previously indicated by the specifier.

5.3.3 Gloss

When a coated test panel is examined in accordance with A.4.3, the gloss level of the coating shall be within the tolerance limits indicated by the manufacturer. If no tolerance limits have been indicated by the manufacturer the gloss level of the coating shall be in accordance with Table 1.

Table 1 — Gloss requirements

Specified gloss level	Acceptable variation from specified gloss level
> 50	± 10
≤ 50	± 7

5.3.4 Adhesion

When a coated test panel is tested in accordance with A.4.4, the result shall be in accordance with the classification 0 of EN ISO 2409.

5.3.5 Resistance to scratching

When a coated test panel is tested in accordance A.4.5, there shall be no penetration through the coating to the substrate.

5.3.6 Resistance to deformation

When a coated test panel is tested in accordance with A.4.6, there shall be no cracking or delamination of the coating from the substrate.

5.3.7 Resistance to mortar

When a coated test panel is tested in accordance with A.4.7, the mortar shall be readily dislodged without the use of an implement. There shall be no detachment of the coating and no change in its appearance.

5.3.8 Resistance to weathering

A coated test panel shall conform to one of the following weathering tests, dependent on the product and following the agreement between the coating applicator and the specifier.

- a) resistance to artificial weathering: After testing in accordance with A.4.8.1, there shall be no signs of cracking or blistering. The residual gloss level shall be more than 40 % of the original gloss level. Colour changes shall be within the limits agreed by the coating applicator and the specifier (e.g. as ΔE and/or ΔC and/or ΔL).
- b) resistance to natural weathering: After testing in accordance with A.4.8.2, there shall be no signs of cracking, blistering or unacceptable colour change.

NOTE Natural weathering tests are generally considered to be more informative than artificial weathering procedures in assessing coating durability, but necessarily take longer.

5.3.9 Resistance to humidity

When a coated test panel is tested in accordance with A.4.9.1 there shall be no blistering, softening or detachment of the coating, nor signs of corrosion of the substrate.

When the coating is tested by the method described in A.4.9.2 the result shall be in accordance with the classification of EN ISO 2409.

5.3.10 Resistance to sulfur dioxide

When a coated test panel is tested in accordance with A.4.10, there shall be no colour change in comparison with an unexposed coated test panel, no blistering of the coating and no signs of corrosion of the substrate.

5.3.11 Permeability

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When a coated test panel is tested in accordance with A.4.11, there shall be no blistering or detachment of the coating. Any blistering within 3 mm of any panel edge shall be ignored.

5.3.12 Resistance to salt spray

5.3.12.1 General

Coating powders shall be subject to the following tests. Coated test panels shall be subjected to one of the two tests, as referred to in 5.3.12.2 or 5.3.12.3, and powders which pass shall be designated by the appropriate "class" by the powder supplier.

5.3.12.2 Neutral salt spray

When tested in accordance with A.4.12.1, there shall be no underfilm corrosion or loss of adhesion extending in a perpendicular direction beyond 5 mm from the scribed lines and there shall be no signs of blistering or cracking on any other part of the panel. Powders which pass this test shall be designated 'Class 1' by the powder supplier.

5.3.12.3 Acetic acid salt spray

When tested in accordance with A.4.12.2, there shall be no underfilm corrosion or loss of adhesion extending in a perpendicular direction beyond 5 mm from the scribed lines and there shall be no signs of blistering or