

# SLOVENSKI STANDARD SIST EN 10169:2022

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### Z organskimi materiali kontinuirno prevlečeni ploščati jekleni izdelki v svitkih -Tehnični dobavni pogoji

Continuously organic coated (coil coated) steel flat products - Technical delivery conditions

# iTeh STANDARD

Kontinuierlich organisch beschichtete (bandbeschichtete) Flacherzeugnisse aus Stahl -Technische Lieferbedingungen

Produits plats en acier revêtus en continu de matières organiques (prélaqués) -Conditions techniques de livraison

#### SIST EN 10169:2022

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SIST EN 10169:2022





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#### SIST EN 10169:2022

# EUROPEAN STANDARD NORME EUROPÉENNE EUROPÄISCHE NORM

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**English Version** 

## Continuously organic coated (coil coated) steel flat products - Technical delivery conditions

Produits plats en acier revêtus en continu de matières organiques (prélaqués) - Conditions techniques de livraison Kontinuierlich organisch beschichtete (bandbeschichtete) Flacherzeugnisse aus Stahl -Technische Lieferbedingungen

This European Standard was approved by CEN on 24 January 2022.

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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 CEN-CENELEC Management Centre has the same status as the official versions.

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#### SIST EN 10169:2022

### EN 10169:2022 (E)

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### **European foreword**

This document (EN 10169:2022) has been prepared by Technical Committee CEN/TC 459/SC 9 "Coated and uncoated flat products to be used for cold forming", the secretariat of which is held by AFNOR.

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of an identical text or by endorsement, at the latest by September 2022, and conflicting national standards shall be withdrawn at the latest by September 2022.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 10169:2010+A1:2012.

In comparison with the previous edition, the following technical modifications have been made:

- addition of the requirement about a maximum six-month duration between production and processing of the coil coated product;
- addition of the corrosion resistance category RC5+ corresponding to very high corrosivity category C5 combining RC5-I and RC5-M that have been removed from this document;
- addition of the UV resistance category  $R_{uv5}$ ;
- addition of third party supervision for natural weathering tests if a certificate is required by the purchaser;
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- definition of a four-year test duration for corrosion resistance category RC5+;
- definition of requirements for natural outdoor UV radiation resistance tests; https://standards.iteh.ai/catalog/standards/sist/1d9f8ae5-
- removal of Geleen from the list of natural outdoor corrosivity exposure sites;
- editorial improvements and updating of normative references.

Any feedback and questions on this document should be directed to the users' national standards body. A complete listing of these bodies can be found on the CEN website.

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

### 1 Scope

This document specifies requirements for continuously organic coated (coil coated) steel flat products. It particularly specifies the performance requirements.

The products covered are wide strip, sheet cut from wide strip, slit wide strip, strip rolled in widths less than 600 mm and cut lengths (from sheet or strip).

NOTE National provisions can set up relationships between the performances of the coatings as required in this document and the outdoor atmospheres and ambiances required for a relevant building under study.

This document is not applicable to continuously organic coated flat products made of:

- tin mill products;
- electrical steels.

#### 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.

EN 10020, Definition and classification of grades of steel

EN 10021, General technical delivery conditions for steel products

EN 10025-1, Hot rolled products of structural steels - Part 1: General technical delivery conditions

EN 10025-2, Hot rolled products of structural steels - Part 2: Technical delivery conditions for non-alloy structural steels

EN 10048, Hot rolled narrow steel strip - Tolerances on dimensions and shape https://standards.iteh.ai/catalog/standards/sist/1d9f8ae5-

EN 10051, Continuously hot-rolled strip and plate/sheet cut from wide strip of non-alloy and alloy steels -Tolerances on dimensions and shape

EN 10079, Definition of steel products

EN 10111, Continuously hot rolled low carbon steel sheet and strip for cold forming - Technical delivery conditions

EN 10130, Cold rolled low carbon steel flat products for cold forming - Technical delivery conditions

EN 10131, Cold rolled uncoated and zinc or zinc-nickel electrolytically coated low carbon and high yield strength steel flat products for cold forming - Tolerances on dimensions and shape

EN 10139, Cold rolled uncoated mild steel narrow strip for cold forming - Technical delivery conditions

EN 10140, Cold rolled narrow steel strip - Tolerances on dimensions and shape

EN 10143, Continuously hot-dip coated steel sheet and strip - Tolerances on dimensions and shape

EN 10152, *Electrolytically zinc coated cold rolled steel flat products for cold forming - Technical delivery conditions* 

EN 10204, Metallic products - Types of inspection documents

EN 10268, Cold rolled steel flat products with high yield strength for cold forming - Technical delivery conditions

EN 10338, Hot rolled and cold rolled non-coated products of multiphase steels for cold forming - Technical delivery conditions

EN 10346, Continuously hot-dip coated steel flat products for cold forming - Technical delivery conditions

EN 13523-1, Coil coated metals - Test methods - Part 1: Film thickness

EN 13523-2, Coil coated metals - Test methods - Part 2: Gloss

EN 13523-3, Coil coated metals - Test methods - Part 3: Colour difference and metamerism - Instrumental comparison

EN 13523-4, Coil coated metals - Test methods - Part 4: Pencil hardness

EN 13523-5, Coil coated metals - Test methods - Part 5: Resistance to rapid deformation (impact test)

EN 13523-6, Coil coated metals - Test methods - Part 6: Adhesion after indentation (cupping test)

EN 13523-7, Coil coated metals - Test methods - Part 7: Resistance to cracking on bending (T-bend test)

EN 13523-8, Coil coated metals - Test methods - Part 8: Resistance to salt spray (fog)

EN 13523-10, Coil coated metals - Test methods - Part 10: Resistance to fluorescent UV radiation and water condensation (standards.iteh.ai)

EN 13523-12, Coil coated metals - Test methods - Part 12: Resistance to scratching

EN 13523-19, Coil coated metals - Test methods - Part 19: Panel design and method of atmospheric exposure testing 2192-414c-b893-0dad541e1096/sist-en-10169-2022

EN 13523-21, Coil coated metals - Test methods - Part 21: Evaluation of outdoor exposed panels

EN 13523-26, Coil coated metals - Test methods - Part 26: Resistance to condensation of water

EN ISO 2815, Paints and varnishes - Buchholz indentation test (ISO 2815)

EN ISO 4618, Paints and varnishes - Terms and definitions (ISO 4618)

EN ISO 4628-2, Paints and varnishes - Evaluation of degradation of coatings - Designation of quantity and size of defects, and of intensity of uniform changes in appearance - Part 2: Assessment of degree of blistering (ISO 4628-2)

EN ISO 4628-4, Paints and varnishes - Evaluation of degradation of coatings - Designation of quantity and size of defects, and of intensity of uniform changes in appearance - Part 4: Assessment of degree of cracking (ISO 4628-4)

EN ISO 4628-5, Paints and varnishes - Evaluation of degradation of coatings - Designation of quantity and size of defects, and of intensity of uniform changes in appearance - Part 5: Assessment of degree of flaking (ISO 4628-5)

EN ISO 8044, Corrosion of metals and alloys - Vocabulary (ISO 8044)

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EN ISO 12944-2, Paints and varnishes - Corrosion protection of steel structures by protective paint systems - Part 2: Classification of environments (ISO 12944-2)

ISO 4997, Cold-reduced carbon steel sheet of structural quality

#### 3 **Terms and definitions**

For the purpose of this document, the terms and definitions given in EN 10020, EN 10021, EN 10079, EN 10204, EN ISO 4618, EN ISO 8044, EN ISO 12944-2 and the following apply.

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

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

#### 3.1

#### accessibility

ease of access to the steel components for the purpose of inspection and maintenance without any work over and above that concerned with routine inspection

#### 3.2

3.3

#### ambience

environmental conditions which prevail in the interior of the building D

Note 1 to entry: These conditions determine the corrosivity category of the ambience and include different parameters such as the air temperature, the relative humidity, the operating conditions in the building (e.g. use of aggressive chemical products, refrigerated areas). dards.iteh.ai)

Note 2 to entry: The atmosphere surrounding the building can influence the ambience.

Note 3 to entry: Annex A gives an example of classification of types of ambience.

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#### building interior application

application in buildings for which the concerned construction products (i.e. components of the building fabric) are submitted to the influence of interior ambiences without significant exposure of any side of the product to the influence of exterior atmospheres

Note 1 to entry: Building products include, for example: liner trays, ribbed profiles for roofing and cladding, curved profiles, brake-pressed profiles, interior wall panels for partitions, ceiling panels, suspended frames (for suspended ceilings), factory foamed (or with mineral wool) sandwich panels for cold rooms or rooms with controlled ambience, interior door frames, interior metal doors, interior metal windows and for ceilings.

Note 2 to entry: Some coil coated products can be used for interior applications having special performance requirements, e.g. lighting. In such cases, these particular requirements should also be considered in consultation with the manufacturer.

Note 3 to entry: For interior building elements, it is important to consider the risk of corrosive attack on the reverse side of the element. This can be especially important in double-skin assemblies (e.g. built up insulated cladding) where the reverse side of the interior element is not easily accessible for maintenance and/or in situations where the interior element is expected to provide long-term durability.

Note 4 to entry: Besides the requirements written in this document, there can be other international or national requirements or regulations regarding fire, safety, food contact etc. that can be considered at the time of enquiry and order.

#### 3.4 building exterior application

application in buildings for which the concerned products are submitted to the influence of exterior atmospheres

Note 1 to entry: Building products include, for example, ribbed profiles for roofing and cladding, curved profiles, brake-pressed profiles, concealed fix roofing and cladding, standing seam roofing, corrugated sheeting, cladding goods, sandwich panels for roofing and cladding, roof tiles, accessories (flashings, trims), rainwater goods (gutters, down pipes), metal doors and garage doors.

Note 2 to entry: For exterior building elements, it is important to consider the risk of corrosive attack on internal, i.e. reverse side surfaces. In particular, buildings with wet or chemically polluted internal environments can require a reverse side organic coating selected to provide enhanced corrosion protection.

Note 3 to entry: This can be especially important in double-skin assemblies (e.g. built-up insulated cladding) where the reverse side of the exterior element is not easily accessible for maintenance and/or in situations where the exterior element is expected to provide long-term durability.

Note 4 to entry: Besides the requirements written in this document, other international or national requirements regarding reaction to fire, safety etc. can be agreed on at the time of enquiry and order.

#### 3.5

#### coating flexibility

ability of a coating to follow without damaging the deformation of the substrate to which it is applied

Note 1 to entry: The flexibility is determined during cold forming of the coated product by the T-bend test.

Note 2 to entry: Cold forming is the process where the main forming is done without heating the working piece. US.IUCI

#### 3.6

#### coating material

coating material <u>SIST EN 10169:2022</u> material comprising organic polymers, i.e. synthetic resin or plastics, to which pigments, additives and solvents (if required) have generally been added, suitable for coil coating

Note 1 to entry: These can be paints (in liquid or powder form) that when applied form an opaque film or plastic film providing protective, decorative and/or specific properties.

#### 3.7 coating systems

#### 3.7.1

#### coating system

combination of the coatings applied on either the top side or the reverse side consisting of one or more coats of one or more coating materials, the designation of which is derived from the relevant coating material

#### 3.7.2

#### multiple-coat system

system comprising a priming coat, possibly intermediate coat(s) and a top coat with particular requirements on appearance, corrosion protection, formability, etc.

#### 3.8

#### nominal organic coating thickness

thickness of the organic coating system either on top side or on reverse side

#### 3.9

#### nominal thickness of an organic coated product

thickness of the metal substrate including metallic coating and excluding thickness of organic coating system

#### 3.10

coating types

#### 3.10.1

#### backing coat

coating of any type on reverse side with no particular requirements on appearance, corrosion protection, formability, etc.

Note 1 to entry: In the case of particular requirements, see 3.7.2.

#### 3.10.2

#### film coating

plastic film applied to the substrate to which generally an adhesive and, if appropriate, a priming coat has been applied beforehand

#### 3.10.3

#### temporary film coating

strippable plastic film applied to the coated surface in order to afford a temporary protection against mechanical damage (see also 6.1.2.3)

#### 3.10.4

# PREVIEW

coat between the priming coat and the top coat

#### 3.10.5

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priming coat https://standards.iteh.ai/catalog/standards/sist/1d9f8ae5first coat of a multiple-coat system 14c-b893-0dad541e1096/sist-en-10169-2022

Note 1 to entry: In the case of particular requirements, see 3.7.2.

#### 3.10.6 top coat finishing coat final (uppermost) coat of a multiple-coat system

#### 3.11

#### coil coating

process in which an (organic) coating material is applied on rolled metal strip in a continuous process which includes cleaning, if necessary, and chemical pre-treatment of the metal surface and either: 1) oneside or two-side, single or multiple application of (liquid) paints or coating powders which are subsequently cured and/or 2) laminating with permanent plastic films

Note 1 to entry: Curing processes include those by convective or inductive heating or by radiation.

Note 2 to entry: Laminating with metal strip resulting in a sandwich system is possible.

Note 3 to entry: A single chemical pre-treatment and primer coat is possible.

#### 3.12

#### colour

sensation resulting from the visual perception of radiation of a given composition (related to EN 13523-22)

Note 1 to entry: A colour is uniquely characterized for a defined observer and a defined light source as well as illuminating and viewing geometry by the coordinates of a point in a space (colorimetric specification with tristimulous values).

#### 3.13

#### colour difference

magnitude and character of the visually perceived, i.e. qualitative, difference between two colours under daylight and artificial light respectively, or the magnitude and direction of the (instrumentally) measured and calculated difference of two colours (related to EN 13523-3)

#### 3.14

### corrosion protection (interior) category

#### CPI

category of coating which presents a certain level of corrosion protection, the choice of which depends on the corrosivity category, the period of protection and the accessibility

#### 3.15

#### corrosion resistance (outdoor) category TANDARD RC

category of product which presents a certain level of corrosion resistance, the choice of which depends on the corrosivity category, the period of resistance and the accessibility

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Note 1 to entry: Different categories of organic coll coated products for outdoor application are classified based on their level of corrosion resistance. Criteria of classification are related to the level of their artificial (accelerated) and natural outdoor corrosion resistance<sub>SIST EN 10169:2022</sub>

Note 2 to entry: These conditions determine the corrosivity category and include both meteorological and pollution parameters (EN ISO 12944-2).

Note 3 to entry: Environmental conditions can apply which are not typical of the region as a whole, e.g. in a rural atmosphere close to a fossil fuel burning power generation plant, areas immediately downwind of the prevailing wind direction can be subjected to an environment closer to urban or even industrial atmospheres. Such special cases should be considered when organic coatings are chosen.

#### 3.16 corrosivity category

#### С

category which indicates the corrosivity of the environment taking into account both atmospheric conditions prevailing around a constituent element of a structure, and micro-environmental effects and shall be used for the selection of the appropriate product (related to EN ISO 12944-2)

Note 1 to entry: The relationship between corrosivity categories and types of atmospheres is given in Table 6.

#### 3.17

#### gloss

optical property of a surface, characterized by its ability to reflect light (related to EN 13523-2)

Note 1 to entry: For qualitative purposes, gloss ranges are often described by the terms "matt", "low gloss" or "semi-matt", "satin", "semi-gloss", "gloss" and "high gloss".

#### 3.18

#### specular gloss

ratio of the luminous flux from an object in the specular direction for a specified source and receptor angle to the luminous flux from polished black glass (related to EN 13523-2)

#### 3.19

#### master coil

coil from which sheets, cut lengths or two or more smaller coils are produced

#### 3.20

#### organic coating

dry paint film of the coated product or the plastic film of the film/metal laminate

#### 3.21

#### period of protection

time between the first exposure of the steel component and the moment at which maintenance works need to be carried out to restore corrosion protection

Note 1 to entry: The need to restore corrosion protection is deemed to arise when failure of the coating has occurred to the point where a significant amount (for example 5 %) of the component surface exhibits corrosion of the substrate.

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#### 3.22

#### reverse side

opposite side of the top side (see 3.26) **PREVIEW** 

3.23

saturated colour

colour with Chroma  $C^* \ge 40$ 

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Note 1 to entry: Chroma C\* is defined by CIE 15:2004./catalog/standards/sist/1d9f8ae5-2192-414c-b893-0dad541e1096/sist-en-10169-2022

#### 3.24

#### substrate

base material from rolled steel flat products, with or without metallic coating

#### 3.25

#### time of wetness

period during which a coated surface is covered by a film of electrolyte that is capable of causing atmospheric corrosion (see EN ISO 12944-2)

Note 1 to entry: Guidance value for time of wetness can be calculated from the temperature and relative humidity by summing the hours where the relative humidity is above 80 % and, at the same time, the temperature is above 0 °C.

#### 3.26

#### top side

side of the strip with the highest decorative demand and/or corrosion protection and which, in normal production, is uppermost, respectively the exterior side of a coil

#### 3.27

#### uncoated

condition in which parts of the surface of the substrate (e.g. one side of the strip) remain uncoated

#### 3.28 UV resistance category *R*<sub>uv</sub>

category of coating which presents a certain level of resistance to degradation by UV radiation

Note 1 to entry: Different categories of organic coil coated products for outdoor application are classified based on their level of UV resistance. Criteria of classification are related to their level of artificial (accelerated) and natural outdoor UV resistance according to the cumulative solar energy of the outdoor exposure site.

#### 3.29

#### test specimen

sample produced on a full scale production line with the complete paint system

#### 3.30

#### rural atmosphere

atmosphere prevailing in rural areas and small towns, without significant contamination by corrosive agents such as sulphur dioxide and/or chlorides

Note 1 to entry: See also EN ISO 12944-2.

#### 3.31

#### urban atmosphere

contaminated atmosphere prevailing in densely populated areas without significant industry

Note 1 to entry: See also EN ISO 12944-2. REVIEW

Note 2 to entry: It has moderate concentrations of pollutants such as sulphur dioxide and/or chlorides.

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#### 3.32

#### industrial atmosphere

atmosphere contaminated by corrosive pollutants from local and regional industry (mainly sulphur https://standards.iteh.ai/catalog/standards/sist/1d9f8ae5-2192-414c-b893-0dad541e1096/sist-en-10169-2022

Note 1 to entry: See also EN ISO 12944-2.

#### **3.33 marine atmosphere** atmosphere over and near the sea

Note 1 to entry: See also EN ISO 12944-2.

Note 2 to entry: A marine atmosphere will extend along a certain distance inland, depending on topography and prevailing wind direction. It has a high content of sea-salt aerosols (mainly chlorides).

Note 3 to entry: The following explanations can be used for guidance:

- Low salinity is typical of areas located between 10 km and 20 km from the seashore.
- Moderate salinity is typical of areas located between 3 km and 10 km from the seashore.
- High salinity is typical of areas located from the seashore to 3 km inland.

Note 4 to entry: A distinction can be made between seashore and seafront. Seafront is defined as the place which is submitted to direct attack by seawater and sea-salt aerosols.