



SLOVENSKI STANDARD SIST EN 1096-1:1999

01-november-1999

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Glass in building - Coated glass - Part 1: Definitions and classification

Glas im Bauwesen - Beschichtetes Glas - Teil 1: Definitionen und Klassifikation

Verre dans la construction - Verre a couche - Partie 1: Définitions et classification

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ICS:

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81.040.20	Steklo v gradbeništvu	Glass in building

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EUROPEAN STANDARD
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EN 1096-1

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ICS 01.040.81; 81.040.20

Descriptors: bulidings, glass, window glass, definitions, characteristics, chemical plating, light transmission, transmittance, spectrophotometry, classifications, defects, acceptability

English version

Glass in building - Coated glass - Part 1: Definitions and classification

Verre dans la construction - Verre à couche - Partie 1:
Définitions et classification

Glas im Bauwesen - Beschichtetes Glas - Teil 1:
Definitionen und Klassifikation

This European Standard was approved by CEN on 13 November 1998.

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, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

Contents

	Page
Foreword	3
1 Scope	4
2 Normative references	4
3 Definitions	5
3.1 Basic definitions	5
3.2 Definitions of additive methods of deposition	5
3.3 Definitions of luminous, solar and thermal properties	6
3.4 Definitions of appearance defects	7
4 Glass substrates	7
5 Luminous, solar and thermal properties	7
5.1 General	7
5.2 Ultraviolet range (280 nm to 380 nm, in accordance with EN 410)	8
5.3 Visible range (380 nm to 780 nm, in accordance with EN 410)	8
5.4 Solar range (300 nm to 2500 nm, in accordance with EN 410)	8
5.5 Thermal range (2500 nm to 50000 nm)	9
6 Classification of coated glass	9
7 Appearance	9
7.1 General	9
7.2 Detection of defects	10
7.3 Conditions of examination	10
7.4 Acceptance criteria of coated glass defects	12
8 Product information	13
8.1 General	13
8.2 Identity card	13
Annex A (informative) Bibliography	15
Annex B (informative) Additional information	16



Foreword

This European Standard has been prepared by Technical Committee CEN/TC 129 "Glass in building", the secretariat of which is held by IBN.

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 1999, and conflicting national standards shall be withdrawn at the latest by May 1999.

CEN/TC 129/WG6, "Coated glass for windows" divided the standard into the four following parts:

Glass in building - Coated glass:

- Part 1: Definitions and classification
- Part 2: Test methods for durability of A, B and S coatings
- Part 3: Test methods for durability of C and D coatings
- Part 4: Factory production control and evaluation of conformity

The present document constitutes Part 1 of the standard.

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

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1 Scope

This European Standard defines the characteristics, properties and classification of coated glass for use in building.

Test methods and procedures used to establish durability are indicated in parts two and three of this standard.

This standard applies to coated glass for glazing application for use in normally occupied domestic or commercial premises.

This standard is not applicable to:

- plastics films on glass
- mirrors
- enamelled glass

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. The normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 410	Glass in building - Determination of luminous and solar characteristics of glazing
EN 572-2	Glass in building - Basic soda lime silicate glass products - Part 2: Float glass https://standards.iteh.ai/catalog/standards/sist/d208eacd-53dd-4076-bfde-3b702846855c/sist-en-1096-1-1998
EN 572-4	Glass in building - Basic soda lime silicate glass products - Part 4: Drawn sheet glass
EN 572-6	Glass in building - Basic soda lime silicate glass products - Part 6: Wired patterned glass
EN 572-7	Glass in building - Basic soda lime silicate glass products - Part 7: Wired or unwired channel shaped glass
EN 673	Glass in building - Determination of thermal transmittance (U value) - Calculation method
prEN 1096-2	Glass in building - Coated glass - Part 2: Test methods for durability of A, B and S coatings
prEN 1096-3	Glass in building - Coated glass - Part 3: Test methods for durability of C and D coatings
prEN 1863	Glass in building - Heat strengthened glass
prEN 12150	Glass in building - Thermally toughened safety glass
EN ISO 12543-2	Glass in building - Laminated glass and laminated safety glass - Part 2 : Laminated safety glass (ISO 12543-2:1998)

- EN ISO 12543-3 Glass in building - Laminated glass and laminated safety glass - Part 3 :
Laminated glass (ISO 12543-3:1998)
- prEN 13024-1 Glass in building - Thermally toughened borosilicate safety glass - Part 1:
Specifications

3 Definitions

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

3.1 Basic definitions

3.1.1 coated glass: Glass substrate as defined in 3.1.2 to which has been applied a coating, as defined in 3.1.3 in order to modify one or more of its properties.

3.1.2 glass substrate: A basic glass, thermally toughened safety glass, thermally toughened borosilicate safety glass, heat-strengthened glass, heat-strengthened borosilicate glass, laminated glass or laminated safety glass.

3.1.3 coating: One or more thin solid layers of inorganic materials applied on to the surface of a glass substrate by various methods of deposition.

3.1.4 on-line coating: The treatment of the surface of a moving continuous ribbon of a basic glass, at a stage during its manufacture, before it is cut.

3.1.5 off-line coating: The application of a coating to individual pieces of glass within a manufacturer's or processor's premises.

3.1.6 additive methods of deposition: Single or multilayer systems (consisting of metals, oxides, nitrides, fluorides or other compounds) added to the surface of the glass by different methods.

3.2 Definitions of additive methods of deposition

3.2.1 chemical film formation processes: Processes where chemical reactions produce films on the glass from liquid, vapour or powder.

3.2.1.1 wet chemical deposition: A mixture of a dissolved metal salt and a reducing compound is sprayed on to the glass surface. A reduction reaction takes place and fine grained metal is precipitated.

3.2.1.2 sol-gel coating: Solutions of metallo-organic-compounds are dip coated and pyrolytically transformed into suitable oxides.

3.2.1.3 chemical-vapour deposition: Compounds in a vapour phase reacting chemically on the hot surface of the glass substrate.

3.2.1.4 spray-coating: Sprayed liquids reacting pyrolytically on the hot surface(s) of the glass substrate.

3.2.1.5 powder coating: Powders reacting chemically on the hot surface of the glass substrate.

3.2.2 physical film formation processes: Processes, under vacuum conditions, whereby materials from a source are transferred as elements, compounds or ions. Their subsequent condensation on the glass surface produces the film. Chemical reactions can be associated with this process.

3.2.2.1 evaporation: The material forming the coating is evaporated by heating and deposited on the glass surfaces.

3.2.2.2 sputtering: In a gas discharge, ions bombard a target causing sputtering of material which condenses on the glass surface.

NOTE: Coatings may also be produced by combinations of the techniques described in 3.2.1 and 3.2.2.

3.3 Definitions of luminous, solar and thermal properties

3.3.1 ultraviolet transmittance (τ_{UV}): Fraction of the incident UV component of the solar radiation that is transmitted by the coated glass.

3.3.2 light transmittance (τ_V): Fraction of the incident light that is transmitted by the coated glass.

3.3.3 nominal colour in transmission: Colour of the glass observed in transmission. It is defined with a qualitative indication.

3.3.4 colour rendering in transmission (R_a): The change in colour of an object as a result of the light being transmitted by the coated glass.

3.3.5 light reflectance of coated side (ρ_V): Fraction of the incident light that is reflected by the coated glass when the light is incident on the coated side.

3.3.6 light reflectance of uncoated side (ρ'_V): Fraction of the incident light that is reflected by the coated glass when the light is incident on the uncoated side.

3.3.7 nominal colour in reflection of coated side: The colour of the glass observed from the coated side. It is defined with a qualitative indication.

3.3.8 nominal colour in reflection of uncoated side: The colour of the glass observed from the uncoated side. It is defined with a qualitative indication.

3.3.9 solar direct transmittance (τ_e): Fraction of incident solar radiation that is directly transmitted by the coated glass.

3.3.10 solar direct reflectance of coated side (ρ_e): Fraction of the incident solar radiation that is reflected by the coated glass when the radiation is incident on the coated side.

3.3.11 solar direct reflectance of uncoated side (ρ'_e): Fraction of the incident solar radiation that is reflected by the coated glass when the radiation is incident on the uncoated side.

3.3.12 total solar energy transmittance (solar factor) (g): Fraction of the incident solar radiation that is totally transmitted by the coated glass (for method of calculation see EN 410).

3.3.13 normal emissivity (ϵ_n): The ratio, in a direction normal to the surface, of the emissive power of the coated surface of the glass to the emissive power of a black body (see EN 673).

3.3.14 thermal transmittance (U-value): The quantity of heat flowing, under steady conditions, in unit time, through a unit surface of the coated glass, for each degree of temperature difference between inside and outside (for method of calculation see EN 673).

3.4 Definitions of appearance defects

3.4.1 uniformity defect: Slight visible variation in colour, in reflection or transmission, within a coated glass pane or from pane to pane.

3.4.2 stain: Defect in the coating larger than punctual defect, often irregularly shaped, partially of mottled structure.

3.4.3 punctual defect: Punctual disturbance of the visual transparence looking through the glass and of the visual reflectance looking at the glass.

NOTE: Spot, pinhole and scratch are types of punctual defect.

3.4.3.1 spot: Defect that commonly looks dark against the surrounding coating, when viewed in transmission.

3.4.3.2 pinhole: Punctual void in the coating with partial or total absence of coating and it normally contrasts clear relative to the coating, when viewed in transmission.

3.4.3.3 scratches: Variety of linear score marks, whose visibility depend on their length, depth, width, position and arrangements.

3.4.4 cluster: Accumulation of very small defects giving the impression of stain.

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4 Glass substrates <https://standards.iteh.ai/catalog/standards/sist/d208eacd-53dd-4076-bfde-0f7988df850/sist-en-1096-1-1999>

The following glass substrates may be used for the production of coated glass-

- Float glass (in accordance with EN 572-2)
- Drawn sheet glass (in accordance with EN 572-4)
- Patterned wired glass (in accordance with EN 572-6)
- Channel shaped glass (in accordance with EN 572-7)
- Thermally toughened soda lime silicate safety glass (in accordance with prEN 12150)
- Thermally toughened borosilicate safety glass (in accordance with prEN 13024-1)
- Heat strengthened soda lime silicate glass (in accordance with prEN 1863)
- Heat strengthened borosilicate glass (a standard about this glass substrate is in preparation, see A.2)
- Laminated glass and laminated safety glass (in accordance with EN ISO 12543 - Parts 2 and 3)

5 Luminous, solar and thermal properties

5.1 General

The purpose of thin coatings on glass is the modification of the spectrophotometric properties of the glass substrate.

The properties of a coating cannot be considered separately from those of the glass substrate to which it is attached. The coating-glass substrate combination is the finished product, i.e. the coated glass.