
Steklo v gradbeništvu - Poslikano steklo za interno uporabo - 2. del: Vrednotenje skladnosti/Standard za proizvod

Glass in building - Painted glass for internal use - Part 2: Evaluation of conformity/Product standard

Glas im Bauwesen - Teil 2: Konformitätsbewertung/Produktnorm

Verre dans la construction - Verre peint pour usage intérieur - Partie 2 : Evaluation de la conformité/Norme de produit

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ICS:

81.040.20

Steklo v gradbeništvu

Glass in building

kSIST FprEN 16477-2:2016

en,fr,de

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

FINAL DRAFT
FprEN 16477-2

June 2016

ICS 81.040.20

English Version

**Glass in building - Painted glass for internal use - Part 2:
Evaluation of conformity/Product standard**

Verre dans la construction - Verre peint pour usage
interieur - Partie 2 : Evaluation de la
conformité/Norme de produit

Glas im Bauwesen - Teil 2:
Konformitätsbewertung/Produktnorm

This draft European Standard is submitted to CEN members for unique acceptance procedure. It has been drawn up by the Technical Committee CEN/TC 129.

If this draft becomes a European Standard, 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.

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

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Contents	Page
European foreword.....	4
1 Scope.....	5
2 Normative references.....	5
3 Terms and definitions	6
4 Requirements	7
4.1 Product description.....	7
4.2 Determination of the characteristic's performances.....	8
4.2.1 Characteristics of painted glass	8
4.2.2 Determination of characteristics of painted glass	8
4.3 Characteristics other than listed in 4.2	12
4.4 Dangerous substances.....	12
5 Assessment and verification of constancy of performance – AVCP.....	12
5.1 General.....	12
5.2 Determination of the product type (see 5.1, 1)	12
5.2.1 General.....	12
5.2.2 Type testing of characteristic's performances.....	13
5.2.3 Test report.....	13
5.2.4 Multiple lines/sites.....	14
5.3 Factory production control (FPC)	14
5.3.1 General.....	14
5.3.2 Inspection of samples in accordance with the prescribed test plan (see 5.1, 2a)	14
5.4 Initial inspection of factory and of factory production control (see 5.1, 2b)	15
5.5 Continuous surveillance and assessment of the factory production control (see 5.1, 2c).....	16
5.6 Procedure for modifications	17
5.7 Pre-production products (e.g. prototypes).....	17
6 Marking and/or labelling	18
6.1 General.....	18
6.2 Product marking.....	18
Annex A (normative) Factory production control.....	19
A.1 Factory Production Control Requirements.....	19
A.1.1 General.....	19
A.1.2 Organization	19
A.1.2.1 Responsibility and authority	19
A.1.2.2 Management representative for factory production control.....	19
A.1.2.3 Management review.....	19
A.1.3 Control system.....	19
A.1.3.1 General.....	19

A.1.3.2 Personnel	19
A.1.3.3 Documentation.....	20
A.1.4 Equipment.....	20
A.1.4.1 Testing.....	20
A.1.4.2 Manufacturing	20
A.1.5 Inspection and testing	20
A.1.6 Non-complying materials/products.....	20
A.2 Inspection and testing tables of painted glass product production	21
A.2.1 Information on Table A.1	21
A.2.2 Use of proxy testing	21
Annex B (informative) Tests for factory production control	24
Annex C (informative) Provisions for voluntary involvement of third party(ies)	25
C.1 General.....	25
C.2 Voluntary tasks for third parties.....	25
C.3 Marking and labelling.....	25
Annex ZA (informative) Relationship of this European Standard with Regulation (EU) No.305/2011	26
ZA.1 Scope and relevant characteristics.....	26
ZA.2 System of Assessment and Verification of Constancy of Performance (AVCP)	27
ZA.3 Assignment of AVCP tasks.....	27
Bibliography.....	30

European foreword

This document (FprEN 16477-2:2016) has been prepared by Technical Committee CEN/TC 129 “Glass in building”, the secretariat of which is held by NBN.

This document is currently submitted to the Unique Acceptance Procedure.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this document.

This Part of the European Standard does not stand alone, it is a part of one standard:

- EN 16477-1: Glass in building – Painted glass for internal use – Part 1: Definitions, requirements and tests methods
- EN 16477-2: Glass in building – Painted glass for internal use – Part 2: Evaluation of conformity/Product standard

This European Standard contains other aspects of importance of trade.

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1 Scope

This European Standard covers the evaluation of conformity and the factory production control of painted glass for internal use in buildings.

NOTE For glass products with electrical wiring or connections for, e.g. alarm or heating purposes, other directives, e.g. Low Voltage Directive, may apply.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 356, *Glass in building - Security glazing - Testing and classification of resistance against manual attack*

EN 410, *Glass in building - Determination of luminous and solar characteristics of glazing*

EN 673, *Glass in building - Determination of thermal transmittance (U value) - Calculation method*

EN 1063, *Glass in building - Security glazing - Testing and classification of resistance against bullet attack*

EN 12600, *Glass in building - Pendulum test - Impact test method and classification for flat glass*

EN 12758, *Glass in building - Glazing and airborne sound insulation - Product descriptions and determination of properties*

EN 12898, *Glass in building - Determination of the emissivity*

EN 13501-1, *Fire classification of construction products and building elements – Part 1: Classification using data from reaction to fire tests*

EN 13501-2, *Fire classification of construction products and building elements – Part 2: Classification using data from resistance to fire tests excluding ventilation services*

EN 13501-5, *Fire classification of construction products and building elements – Part 5: Classification using data from fire exposure roof tests*

EN 13541, *Glass in building - Security glazing - Testing and classification of resistance against explosion pressure*

EN 15998, *Glass in building - Safety in case of fire, fire resistance - Glass testing methodology for the purpose of classification*

FprEN 16477-1:2016, *Glass in building – Painted glass for internal use – Part 1: Definitions, requirements and tests methods*

prEN 16612, *Glass in building - Determination of the load resistance of glass panes by calculation and testing*

3 Terms and definitions

For the purposes of this document, the terms and definitions in FprEN 16477-1:2016 and the following apply.

3.1

factory production control

FPC

documented, permanent and internal control of production in a factory, in accordance with this standard

Note 1 to entry: See also Annexes A and B.

3.2

product-type

set of representative performance levels or classes of a construction product, in relation to its essential characteristics, produced using a given combination of raw materials or other elements in a specific production process

3.3

essential characteristic

characteristic of the construction product which relate to the basic requirements for construction works

Note 1 to entry: Basic requirements for construction work are given in the regulation (EU) No 305/2011, Annex I.

3.4

performance of a construction product

performance related to the relevant essential characteristics, expressed by level or class, or in a description

3.5

level

result of the assessment of the performance of a construction product in relation to its essential characteristics, expressed as a numerical value

3.6

class

range of levels, delimited by a minimum and a maximum value, of performance of a construction product

3.7

type testing

TT

determination of the performance of a product (characteristic, durability), on the basis of either actual tests or other procedures (such as conventional, standardised, tabulated or general accepted values, standardised or recognised calculation methods, test reports when made available, ...), in accordance with this document and that demonstrates compliance with this European standard

3.8**test report**

document that covers the results of tests undertaken on a representative sample of the product from production or on a prototype design of the product

3.9**product description**

document that details the relevant parameters, e.g. process conditions, structure, type and subtype of interlayer, type of glasses etc., for defining a product that complies with the standard and that includes specific reference(s) to characteristics that are modified by the production process

3.10**product family**

group of products determined by the manufacturer, which is made with similar components and which is tested for TT/FPC using the same test method

3.11**significant change**

variation in performance beyond the permitted tolerance for the characteristic which is not covered by substitution rules

4 Requirements

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4.1 Product description

For conformity purposes the painted glass manufacturer is responsible for the preparation and maintenance of the product description. This description shall describe the product and/or product families.

Disclosure of the product description shall be at the discretion of the painted glass manufacturer or his agent except in the case of regulatory requirements.

The product description shall contain at least the following:

- reference to EN 16477 Parts 1 and 2 and all other standards with which the manufacturer claims compliance.
- materials making up the layers of the painted glass.
- glass substrates

The layers may be listed either in full, i.e. chemical composition, or by manufacturers' code.

The definition of product families shall be consistent with the product description.

The substitution of materials shall maintain the conformity with the product description. The substituting material can be added to the product description when compliance has been demonstrated.

4.2 Determination of the characteristic's performances

4.2.1 Characteristics of painted glass

4.2.1.1 General

The characteristics of painted glass, listed in Table 1, are those of the glass substrate (see 4.2.1.2). Since they are not changed significantly by the painting process, they shall be used for painted glass.

For glass substrates covered by Harmonized European specifications, generally accepted values, declared values, or calculated values of the characteristics listed in Table 1 shall be used.

if glass panes are used which are not covered by Harmonized European Specifications (as defined in regulation EU 305/2011), it shall be demonstrated that those glasses have a chemical composition and a mechanical stability over time equivalent to the requirements of the relevant standard listed.

Table 1 — Characteristics of glass components

Characteristic	Symbol	Unit
Density	ρ	kg/m ³
Hardness (Knoop hardness in accordance with ISO 9385)	$HK_{0,1/20}$	Dimensionless
Young's modulus	E	GPa
Poisson's ratio	μ	Dimensionless
Characteristic bending strength	$f_{g, k}$	MPa
Resistance against sudden temperature changes and temperature differentials		K
Specific heat capacity	c	J/(kg.K)
Coefficient of linear expansion	α_l	K ⁻¹
Thermal conductivity	λ	W/(m.K)
Mean refractive index to visible radiation	n	Dimensionless

4.2.1.2 Glass panes used as components for the production of laminated and laminated safety glass

The glass substrate listed in FprEN 16477-1:2016, Clause 4 may be used for the production of painted glass.

4.2.2 Determination of characteristics of painted glass

4.2.2.1 General

If the painted glass manufacturer wishes to claim that any performance characteristic is independent of the production equipment used then the factory production control system shall be in accordance with this standard including his specific process control conditions.

4.2.2.2 Safety in the case of fire - Resistance to fire

Fire resistance shall be determined and classified in accordance with EN 13501-2.

EN 15998 specifies the testing methodology to be used for glass products that are claiming fire resistance.

4.2.2.3 Safety in the case of fire - Reaction to fire

Reaction to fire shall be determined and classified in accordance with EN 13501-1.

CEN/TS 15117:2005, 6.3, specifies that if the painted glass is applied on a non-combustible substrate (e.g. wall) the paint is considered as an internal non substantial component and A1 criteria may be applied.

When the PCS of the paint component of the painted glass does not exceed 1,4 MJ/m², Painted glass are products/materials that may be classified A1 following EN 13501-1.

When the PCS of the paint component of the painted glass does not exceed 4 MJ/m², Painted glass are products/materials that may be classified A2 following EN 13501-1.

NOTE 1 PCS (gross calorific potential, MJ/kg or MJ/m²) is evaluated following EN ISO 1716.

NOTE 2 The undertaking of PCS determination can be unnecessary if test report according to EN ISO 1716 are supplied by paint supplier

If the application is not against a non-combustible substrate (e.g. wall) the paint is considered as an external non substantial component and a general classification according to EN 13501-1 applies.

An increase of glass thickness will not adversely affect the classification with respect to reaction to fire and do not require a new type test.

4.2.2.4 Safety in the case of fire - External fire behaviour (for roof coverings only)

Where the manufacturer wishes to declare external fire performance (e.g. when subject to regulatory requirements), the product shall be tested in accordance with EN 13501-5.

4.2.2.5 Safety in use - Bullet resistance: shatter properties and resistance to attack

Bullet resistance shall be determined and classified in accordance with EN 1063.

4.2.2.6 Safety in use - Explosion resistance: impact behaviour and resistance to impact

Explosion resistance shall be determined and classified in accordance with EN 13541.

4.2.2.7 Safety in use - Burglar resistance: shatter properties and resistance to attack

Burglar resistance shall be determined and classified in accordance with EN 356.

4.2.2.8 Safety in use - Pendulum body impact resistance: shatter properties (safe breakability) and resistance to impact

Pendulum body impact resistance shall be determined and classified in accordance with EN 12600.

4.2.2.9 Safety in use - Mechanical resistance: Resistance against sudden temperature changes and temperature differentials

The resistance against sudden temperature changes and temperature differentials is a generally accepted value that is given in the relevant glass substrate standard and shall be ensured by compliance with this standard.

4.2.2.10 Safety in use - Mechanical resistance: Resistance against wind, snow, permanent load and/or imposed loads of the glass unit

The mechanical resistance of painted glass is a characteristic value that shall be ensured by compliance with this standard.

The value to be declared is the characteristic bending strength as defined in the relevant product standard of the glass substrate. As long as on the concerned construction or building site prEN 16612 is not applicable for the design then the current method of determining mechanical resistance in the country of destination shall be applied.

4.2.2.11 Protection against noise - Direct airborne sound reduction

The sound reduction indexes shall be determined in accordance with EN 12758.

However, the information supplied with the incoming glass can be used as the painted glass production process does not alter the values.

4.2.2.12 Energy conservation and heat retention - Thermal properties

The thermal transmittance value (U -value) shall be determined by calculation in accordance with EN 673 with:

- Normal emissivity ϵ : the declared value of the glass manufacturer. If the information is not available, the emissivity shall be determined in accordance with EN 12898.
- nominal thickness of the glass panes

4.2.2.13 Energy conservation and heat retention - Radiation properties: Light transmittance and reflectance

The light transmittance and reflectance shall be determined in accordance with EN 410.

4.2.2.14 Energy conservation and heat retention - Radiation properties: Solar energy characteristics

The solar direct transmittance, the solar direct reflectance and the total solar energy transmittance (solar factor or g -value) shall be determined in accordance with EN 410.

4.2.2.15 Durability / Type of painted glass

Products shall conform to the definition, to the manufacturer's product description and fulfil the requirements of painted glass.

The type testing concerns the product aspects as listed in Table 2.