SLOVENSKI STANDARD
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Steklo v gradbeništvu - Poslikano steklo za interno uporabo - 1. del: Zahteve

Glass in building - Painted glass for internal use - Part 1: Requirements

Glas im Bauwesen - Farbiges Glas für den Innenbereich - Teil 1: Prüfungen und Anforderungen

Verre dans la construction - Verre laqué destiné à un usage à l'intérieur - Partie 1: Essais et exigences

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81.040.20 Steklo v gradbeništvu Glass in building

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Glass in building - Painted glass for internal use - Part 1: Requirements

Verre dans la construction - Verre laqué destiné à un usage à l'intérieur - Partie 1: Essais et exigences

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Foreword

This document (prEN 16477-1:2012) 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 CEN Enquiry.

Introduction

1 Scope

This European Standard specifies minimum quality requirements (in respect of optical, visual and edge faults) and durability tests for painted glass for internal use in building.

This standard applies only to painted glass manufactured from annealed soda lime silicate float glass or coated annealed soda lime silicate float glass (see EN 572-1, 572-2 and EN 1096-4). The painted glass may be translucent, transparent or opaque and supplied in stock/standard sizes and as-cut finished sizes.

NOTE 1 Painted glass may be manufactured from other annealed glass or thermally treated glass. However the standard does not give information on minimum quality requirement for this substrate. The durability test methods are applicable.

For painted glass used in aggressive and/or constantly high humidity atmospheres, e.g. horse riding halls, swimming pools, medical baths, saunas, etc. this standard is not applicable.

NOTE 2 Bathrooms and kitchens are not considered as constantly high humidity atmospheres.

This standard does not give requirements for framing, fixing or other support systems.

NOTE 3 Useful advice on these items is contained in the informative annex C.

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 572-1, *Glass in building – Basic soda lime silicate glass products – Part 1: Definitions and general physical and mechanical properties.*

EN 572-2, *Glass in building – Basic soda lime silicate glass products – Part 2: Float glass.*

EN 572-8, *Glass in building – Basic soda lime silicate glass products – Part 8: Supplied and final cut sizes.*

EN 572-9, *Glass in building – Basic soda lime silicate glass products- Part 9 Evaluation of conformity/Product standard.*

EN 1096-4, *Glass in building - Coated glass - Part 4: Evaluation of conformity/Product standard.*

ISO 2409:1992, *Paints and varnishes – Cross-cut test.*

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

ISO 11664-4, *Colorimetry - Part 4: CIE 1976 L*a*b* Colour space.*

3 Terms and definitions

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

3.1
painted glass
flat glass whose rear surface has been coated with a paint

3.2
paint
organic coating covering glass

3.3
stock/standard sizes
panes of painted glass supplied with as-cut edges which are intended for further processing

3.4
finished sizes
finished panes of painted float glass cut from stock/standard sizes which may be as-cut or subject to further processing, e.g. edges working, drilling, face decoration etc.

3.5
glass appearance faults
faults which alter the visual quality of the painted glass, for example spot and/or linear and/or enlarged area faults

3.6
paint coating(s) faults
faults which are directly related to the paint coating, for example scratches, spot faults, and variation of colour or lack of adhesion of the paint coating

3.7
Spot faults
punctual disturbance that may come from a glass defect e.g. nuclei (solid or gaseous inclusions), deposits, crush marks or from a paint coating defect e.g. dust, pinhole, de-wetting and observed from the glass side

3.8
lack of adhesion point
spot fault where the paint is no longer adhered to the glass, detected in reflection as a more brilliant point

3.9
cluster
group of not less than 3 spot faults, separated by not more than 50 mm

3.10
linear faults
scratches, extended spot faults etc. on the glass surface or on the paint, seen from the glass surface side

3.11
glass brush marks
very fine circular scratches that are barely visible and are associated with glass cleaning techniques

3.12
variation of colour
change of colour that may occur after an ageing test e. g. fading

4 Materials

4.1 Glass products

Painted glass, according to this standard, is made from glass products generally conforming to:

— Soda lime silicate float glass conforming to EN 572-9;

— Coated glass conforming to EN 1096-4;

— Surface treated glass (acid-etched and sand blasted glass).

Other glass types may also be used.

4.2 Paint coating(s)

The glass described in 4.1 shall be covered partially or completely by one or more paint layers.

5 Dimensional requirements

5.1 Thickness

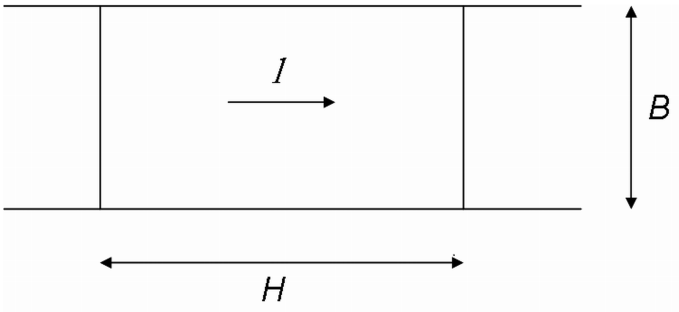
The actual thickness shall be the average of four measurements, taken to the nearest 0,01 mm, one taken at the centre of each side. Measurement shall be performed by an appropriate instrument e.g. a calliper micrometre.

The nominal thickness of the painted product declared by the manufacturer is the nominal thickness of the substrate. The actual thickness, rounded to the nearest 0,1 mm shall not vary from the declared thickness by more than the tolerances of the substrate.

5.2 Length, width and squareness

5.2.1 Width B and length H

When painted glass sizes are quoted for rectangular panes, the first dimension shall be the width B and the second dimension the length H as shown in figure 1.



Key

H Length of rectangular pane

B Width of rectangular pane

l Direction of draw

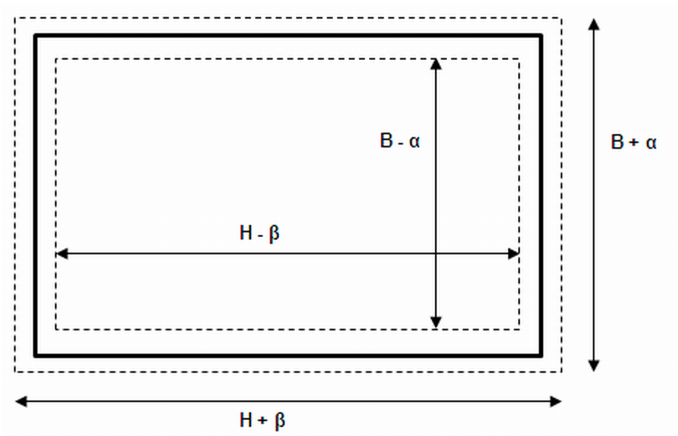
Figure 1 — Relationship between length, width and direction of flaw

Dimensions shall be given in millimetres. Each dimension shall be within the limit deviations specified.

5.2.2 Methods of measuring dimensions and squareness

The nominal dimensions for width B and length H being given, the pane shall not be larger than the nominal dimensions increased by the tolerance or smaller than the nominal dimensions reduced by the tolerance (see Figure 2).

The squareness of rectangular glass panes is expressed by the difference between its diagonals (see figure 3). The difference between the two diagonals shall not be larger than the deviation mentioned in product standard corresponding to the glass substrate.



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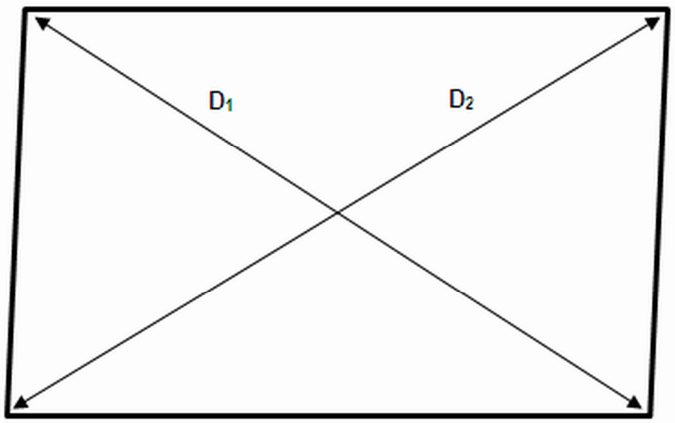
B Width

H Length

α,β Tolerance limits for dimensions

Figure 2 — Determination of dimensions



Key

D1, D2 Diagonals

Figure 3 — Determination of diagonals

Evaluation methods and tolerances of the glass substrate product standard apply.

6 Quality requirements

6.1 General

The quality of a painted glass can be affected by faults resulting from faults in the paint and faults in the glass.

6.2 Quality assessment and inspection methods for painted glass

6.2.1 Visual inspection method

6.2.1.1 Inspection of the opaque painted glass (in reflection)

The painted glass shall be observed in a vertical position against an unlit background, glass side, with the naked eye and under normal diffused lighting conditions, from a distance of 1 m. The direction of observation is normal, i.e. at right angle, to the painted glass. The use of an additional lighting source, e.g. spotlight, is not allowed. Defects on painted side are acceptable as long as they are not visible from the glass side.

NOTE Normal diffused lighting conditions is assumed to be natural daylight or simulated daylight illuminant D65, observer 10°, between 300 Lux and 600 Lux at the painted glass.

6.2.1.2 Inspection of the translucent and transparent painted glass (in transmission)

The painted glass shall be observed in a vertical position against a lit background, glass side, with the naked eye and under normal diffused lighting conditions, from a distance of 1 m. The direction of observation is normal, i.e. at right angle, to the painted glass. The use of an additional lighting source, e.g. spotlight, is not allowed. Defects on painted side are acceptable as long as they are not visible from the glass side.

NOTE Normal diffused lighting conditions is assumed to be natural daylight or simulated daylight illuminant D65, observer 10°, between 300 Lux and 600 Lux at the painted glass.

6.2.2 Measurement of the ΔE^*

The ΔE^* should be measured on the glass side, according to annex B.

6.2.3 Painted glass faults

Glass and paint faults are assessed using the method in 6.2.1. The dimension and number of spots, hairline scratches and scratches that cause disturbance to vision shall be noted.

6.2.4 Edge faults

The edge quality of stock/standard or as-cut finished painted glass can be affected by the presence of entrant/emergent faults and shelling. Using the inspection method of 6.2.1, the edges of the painted glass panes shall be checked for the presence of shells, corners on/off and edge vents.

6.3 Acceptance levels

6.3.1 Glass faults

The acceptance level for glass faults are given in :

— Table 2 for stock/standard sizes;

— Table 3 for as-cut finished sizes.

NOTE The tables are based on soda lime silicate float glass (EN 572-9). Other glass type refer to applicable product standards.

Table 1 — Acceptance levels of faults in painted glass in stock/standard sizes [a]

Linear faults (mm)	Painted glass [b]	
	Jumbo size	All different sizes
	Max defects /sheet (19,3 m²)	Defects / m²
Brush marks (≤ 50)	8	0,37
Scratches (≤ 50)	3	0,14
Spot faults [c] (mm)	Painted glass	
	Jumbo size	All different sizes
	Max defects /sheet (19,3 m²)	Defects / m²
≤ 0,5	Accepted [d]	Accepted [d]
>0,5 and ≤ 1	10	1.35
> 1	1	0.16

a A border zone of 50 mm around the painted glass shall be discarded and not subjected to defect restriction.

b The average shall be calculated taking into account the total individual pack area (m²). All calculation assume mathematical rounding.

c The dimensions stated are without the effect of the halo (see EN 572-2) and relate to the largest of the fault dimensions.

d Accepted, providing they do not form a cluster.