SLOVENSKI STANDARD
SIST EN 177:1998

01-november-1998

Suho stiskane keramiļ ne ploģļ ice z vodovpojnostjo 3 %<E<= 6 % - skupina BIIa

Dust-pressed ceramic tiles with a water absorption of 3%<E<=6% (Group BIIa)

Trockengepreßte keramische Fliesen und Platten mit einer Wasseraufnahme von 3% <E<=6% (Gruppe BIIa)

Carreaux et dalles céramiques pressés à sec à absorption d'eau 3%<E<=6% (Groupe BIIa)

Ta slovenski standard je istoveten z: **EN 177:1991**

ICS:

91.100.23 Keramiļ ne ploģļ ice Ceramic tiles

SIST EN 177:1998 **en**

EUROPEAN STANDARD

NORME EUROPEENNE

EUROPAISCHE NORM

REPUBLIKA SLOVENIJA
MINISTRSTVO ZA ZNANOST IN TEHNOLOGIJO
Urad RS za standardizacijo in meroslovje
LJUBLJANA
SIST EN 177
PREVZET PO METODI RAZGLASITVE

EN 177:1991

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Supersedes EN 177:1984

Descriptors: Tiles, coating slabs, water absorption tests, equipment specifications, shape, dimensions, dimensional tolerance, appearance, physical properties, mechanical properties, chemical properties, marking

English version

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This European Standard was approved by CEN on 1991-09-18
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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, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

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

Foreword

This European Standard was drawn up by the Technical Committee CEN/TC 67 'Ceramic tiles', the Secretariat of which is held by UNI.

According to the common CEN/CENELEC rules, the following countries are bound to implement this European Standard:
Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope and field of application

This European Standard specifies the sizes, dimensional tolerances, mechanical, physical and chemical requirements, surface quality requirements and marking of ceramic tiles.

It is applicable only to dust-pressed ceramic tiles of first quality, including tiles premounted on sheets, with a water absorption of 3 % < E < 6 % according to Group BIIa of EN 87, for interior and exterior use (see clause 7 ordering) on both floors and walls.

2 References

EN 87 'Ceramic floor and wall tiles — Definitions, classification, characteristics and marking'

EN 98 'Ceramic tiles — Determination of dimensions and surface quality'

EN 99 'Ceramic tiles — Determination of water absorption'

EN 100 'Ceramic tiles — Determination of modulus of rupture'

EN 101 'Ceramic tiles — Determination of scratch hardness of surface according to Mohs'

EN 102 'Ceramic tiles — Determination of resistance to deep abrasion — Unglazed tiles'

EN 103 'Ceramic tiles — Determination of linear thermal expansion'

EN 104 'Ceramic tiles — Determination of resistance to thermal shock'

EN 105 'Ceramic tiles — Determination of crazing resistance'

EN 106 'Ceramic tiles — Determination of chemical resistance — Unglazed tiles'

EN 122 'Ceramic tiles — Determination of chemical resistance — Glazed tiles'

EN 154 'Ceramic tiles — Determination of resistance to surface abrasion — Glazed tiles'

EN 163 'Ceramic tiles — Sampling and basis for acceptance'

EN 202 'Ceramic tiles — Determination of frost resistance'

3 Description

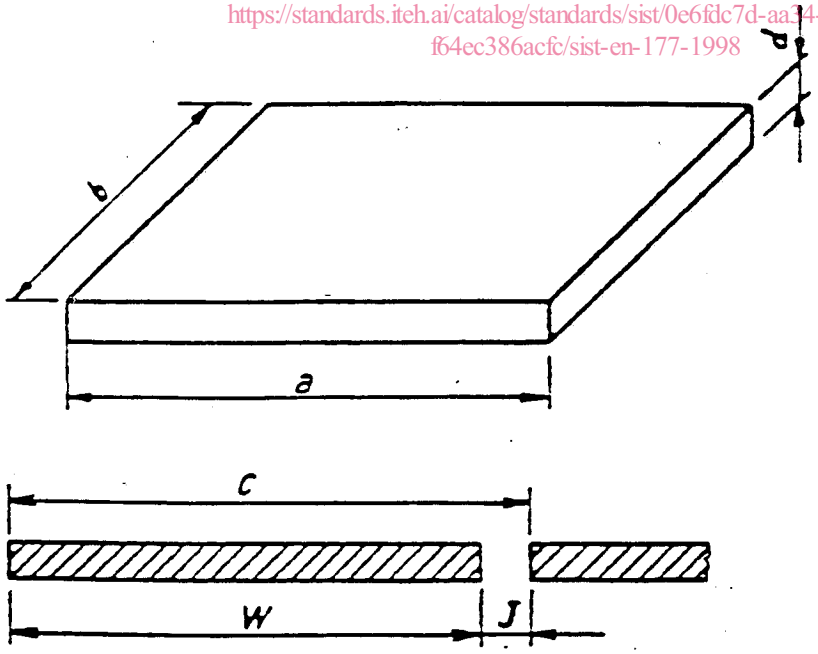
The definition of dust-pressed ceramic tiles is given in EN 87. Mosaic is a tile of any geometrical shape whose surface area is equal or less than 90 cm^2. The surface of tiles and components belonging to this group can be smooth, profiled, wavy, decorated or finished in some other way. It can be unglazed (UGL), glossy, matt or semi-matt (GL).

Although tiles have a visible surface and usually a surface which is intended to be adhered and bears a back panel, they may have identical surfaces without a panel or marking.

Tiles may have spacer lugs.

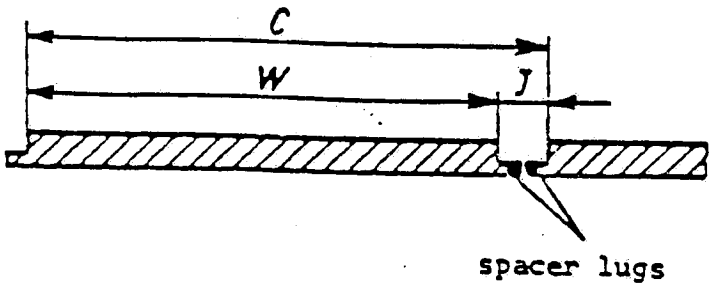
4 Shapes and sizes

For shapes and sizes see tables 1 and 2 and figures 1 and 2.



Co-ordinating size *(C)* = Work size *(W)* + Joint width *(J)*
Work size *(W)* = Dimensions of the visible face *(a)* and *(b)*

Figure 1. Tile



Co-ordinating size *(C)* = Work size *(W)* + Joint width *(J)*
Work size *(W)* = Dimensions of the visible face *(a)* and *(b)*

Figure 2. Tile with spacer lug

4.1 Modular preferred sizes

Table 1

Co-ordinating size *(C)* cm	Work size *(W)* mm		Thickness mm *(d)*
	Length *(a)*	Width *(b)*	
M 10 × 10 M 15 × 15 M 20 × 10 M 20 × 15 M 20 × 20 M 30 × 30	The manufacturer shall choose the work size in order to allow a nominal joint width of between 2 mm and 5 mm		The thickness shall be specified by the manufacturer. It includes the profile on the visible face and on the rear side

4.2 Non-modular sizes

The most common sizes are:

Table 2

Nominal size *(N)* cm	Work size *(W)* mm		Thickness mm *(d)*
	Length *(a)*	Width *(b)*	
10 × 10 15 × 7,5 15 × 10 15 × 15 15,2 × 7,6 15,2 × 15,2 20 × 10 20 × 20 25 × 25 30 × 15 30 × 20 30 × 30 40 × 30	The manufacturer shall choose the work size in such a way that the difference between the work size and the nominal size is not more than ± 2 % and 5 mm		The thickness shall be specified by the manufacturer. It includes the profile on the visible face and on the rear side

4.3 Other sizes

For tiles with dimensions other than those given in tables 1 and 2, the work size shall be stated by the manufacturer. The relevant requirements for work size and thickness given in the respective tables are applicable.

4.4 Spacer lug tiles

Spacer lugs are projections, which are located along certain edges of tiles so that when two tiles are placed together, in line, the lugs on adjacent edges separate the tiles by a distance not less than the specified width of joint. Lugs are positioned so that the joint between the tiles may be filled with grout without the lugs remaining exposed.

Dust-pressed tiles may be made with other spacer lug systems and in such cases the manufacturer's work size shall apply.

For example of spacer lug tiles see figure 2.

NOTE. Some tiles have one or more manufacturing projections part way along certain edges and smaller than 0,3 mm. These are not intended as spacer lugs and should not be used to space joints.

4.5 Accessories

Dimensions of accessories and their tolerances are not standardized and these shall be stated by the manufacturer where appropriate.

5 Requirements

Given the wide diversity of tile/component sizes as found in practice, shape and dimensional requirements shall be based upon the surface area determined by nominal dimensions of the tiles and components in question.

Dimensional and surface quality requirements and physical and chemical properties shall be as given in table 3.

Sampling and basis for acceptance shall be in accordance with EN 163.

Table 3

	Surface S of the product (cm^2)				Test according to
	$S \leq 90$	$90 < S \leq 190$	$190 < S \leq 410$	$S > 410$	
Dimensions and surface quality					
Length and width					
e The deviation in % of the average size for each tile (2 or 4 sides) from the work size *(W)*	± 1,2	± 1,0	± 0,75	± 0,6	EN 98
f The deviation in % of the average size for each tile (2 or 4 sides) from the average size of the 10 test specimens (20 or 40 sides)	± 0,75	± 0,5	± 0,5	± 0,5	EN 98
Thickness					
The deviation, in % of the average thickness of each tile from the work size thickness	± 10	± 10	± 5	± 5	EN 98
Straightness of sides[1] *(facial sides)*					
The maximum deviation from straightness, in % related to the corresponding work sizes	± 0,75	± 0,5	± 0,5	±0,5	EN 98
Rectangularity[1]					
The maximum deviation from rectangularity in % related to the corresponding work sizes	± 1,0	± 0,6	± 0,6	± 0,6	EN 98
Surface flatness					
The maximum deviation from flatness, in %					
(a) Centre curvature, related to diagonal calculated from the work sizes	± 1,0	± 0,5	± 0,5	± 0,5	EN 98
(b) Edge curvature, related to the corresponding work size	± 1,0	± 0,5	± 0,5	± 0,5	EN 98
(c) Warpage, related to diagonal calculated from the work sizes	± 1,0	± 0,5	± 0,5	± 0,5	EN 98
Surface quality[2]	Min. 95 % of tiles shall be free from visible defects that would impair the appearance of a major area of tiles				EN 98

1) Not applicable for tiles having curved shapes.

2) Because of firing, slight variations from the standard colour are unavoidable. This does not apply to intentional irregularities of colour variation of the face of dust-pressed tiles of low water absorption (which can be unglazed, glazed or partly glazed) or to the colour variation over a tile area, which is characteristic for this type of tile and desirable. Spots or coloured dots which are introduced for decorative purposes are not considered a defect.

Table 3 *(concluded)*

	Surface S of the product (cm²)				Test according to
	$S \leq 90$	$90 < S \leq 190$	$190 < S \leq 410$	$S > 410$	
Physical properties					
Water absorption % by weight	Average $3 < E < 6$ Individual max. 6,6				EN 99
Modulus of rupture in N/mm²	Average > 22 min. 20				EN 100
Scratch hardness of surface (Mohs' scale)					
(a) glazed tiles	min. 5				EN 101
(b) unglazed tiles	min. 6				
Abrasion resistance					
(a) *Resistance to deep abrasion of unglazed tiles*					
Removed volume in mm³	max. 345				EN 102
(b) *Resistance to abrasion of glazed tiles*					
Class I – IV	According to the abrasion class indicated by the manufacturer				EN 154
Co-efficient of linear thermal expansion from ambient temperature to 100 °C (K^{-1})	max. 9×10^{-6}				EN 103
Thermal shock resistance	required				EN 104
Crazing resistance[3] *glazed tiles*	required				EN 105
Frost resistance	required if agreed				EN 202
Chemical properties					
Resistance to staining of glazed tiles					
Class 1 – 3	min. Class 2				EN 122
Resistance to household chemicals and swimming pool water cleansers, except to cleansing agents containing hydrofluoric acid and its compounds					
(a) glazed tiles Class AA – D	min. Class B				EN 122
(b) unglazed tiles	required				EN 106
Resistance to acids and alkalis (with the exception of hydrofluoric acid and its compounds)					
glazed tiles Class AA – D	required if agreed according to the chemical resistance class indicated by the manufacturer				EN 122
unglazed tiles	required[4]				EN 106

3) Certain decorative effects may have a tendency to craze. These shall be identified by the manufacturer, in which case the crazing test given in EN 105 is not applicable.

4) If the hue becomes slightly different this is not considered to be chemical attack.