BS EN 1304:2013

BSI Standards Publication

Clay roofing tiles and fittings — Product definitions and specifications

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National foreword

This British Standard is the UK implementation of EN 1304:2013. It supersedes BS EN 1304:2005 which is withdrawn.

Only clay tiles and fittings tested for impermeability as described in EN 539-1:2005, Clause 6, and classified as Category 1 in 4.4.1.2 b) Test method 2 should be used in the UK.

The UK participation in its preparation was entrusted to Technical Committee B/542/3, Clay roofing tiles.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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Compliance with a British Standard cannot confer immunity from legal obligations.

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Clay roofing tiles and fittings - Product definitions and specifications

Tuiles et accessoires en terre cuite - Définitions et spécifications des produits

Dach- und Formziegel - Begriffe und Produktspezifikationen

This European Standard was approved by CEN on 5 April 2013.

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

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Foreword

This document (EN 1304:2013) has been prepared by Technical Committee CEN/TC 128 “Roof covering products for discontinuous laying and products for wall cladding”, 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of an identical text or by endorsement, at the latest by November 2013, and conflicting national standards shall be withdrawn at the latest by November 2013.

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

This document supersedes EN 1304:2005.

In comparison to the previous edition, the following clauses are changed: 4.4.3, 4.6, Annex C and Annex ZA.

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 document is part of a package of standards on clay roofing tiles and fittings.

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

1 Scope

This European Standard specifies requirements for clay roofing tiles and fittings for pitched roof coverings and wall cladding and lining.

It applies to all tiles and fittings as defined in Clause 3.

Clay roofing tiles and clay fittings which conform to this European Standard are suitable for use as roof coverings, vertical wall cladding and lining.

This European Standard defines the minimum requirements for a product which if satisfactory at the time of delivery will ensure that the product is able to perform its function in relation to the performance levels declared for it, whilst subjected to the changes that occur in such materials during normal conditions of use.

The results obtained according to the European Standard apply to products at the time they are offered for sale.

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 538, *Clay roofing tiles for discontinuous laying — Flexural strength test*

EN 539-1:2005, *Clay roofing tiles for discontinuous laying — Determination of physical characteristics — Part 1: Impermeability test*

EN 539-2:2013, *Clay roofing tiles for discontinuous laying — Determination of physical characteristics — Part 2: Test for frost resistance*

EN 1024, *Clay roofing tiles for discontinuous laying — Determination of geometric characteristics*

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

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

3 Terms and definitions

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

3.1 General

3.1.1
clay roofing tiles
products for discontinuous laying on pitched roofs, and for wall cladding, which are manufactured by shaping (extrusion and/or pressing), drying and firing of the prepared clay, with or without additives

Note 1 to entry: All or part of their surface can be covered with an engobe or glaze.

The principal types of tile are:

3.1.1.1
special tiles
tiles made to shapes that vary from tile to tile for aesthetic reasons, for example hand-made tiles

3.1.1.2
tiles with sidelock and headlock
tiles with one or more longitudinal and transverse interlocking device(s)

3.1.1.3
tiles with sidelock only
tiles with a longitudinal interlocking device but no transverse one

Note 1 to entry: They can be used to obtain variable headlaps.

3.1.1.4
tiles with headlock only
tiles with a transverse interlocking device but no longitudinal one

3.1.1.5
tiles with variable headlap
tiles with sidelock and headlock where the design of the tiles allows them to be fixed at varying headlaps

3.1.1.6
tiles with variable sidelap
tiles with sidelock and headlock where the design allows variation in the amount of sidelap

3.1.1.7
plain tiles
tiles usually with a flat surface that can be slightly cross cambered and/or longitudinally cambered and which have no interlocking system

Note 1 to entry: These tiles are generally rectangular, but can have a specially shaped tail (e.g. fish-scale tiles with a rounded or sharp front edge).

3.1.1.8
overlapping tiles
tiles which have no side or headlock and are profiled in an "S" shape

3.1.1.9
over and under tiles
tiles with the shape of a gutter whose design makes it possible either to fix them with variable headlaps or where their headlap is fixed due to the presence of lugs on the tiles

Note 1 to entry: They are made with their edges either parallel or forming a cone.

3.2 General

3.2.1
clay roofing fittings
products that are complementary to the tiles and have a technical function

There are two types of fittings:

3.2.2.1
coordinated fittings
fittings that are intended to align or dimensionally interlock with the tiles with which they are to be laid

EXAMPLE interlocking verge tile, interlocking ventilation tile, tile-and-a-half, interlocking ridge tiles, interlocking or aligning hip tile, aligning valley tile, interlocking or aligning angle tiles

3.2.2.2
uncoordinated fittings
fittings that are not required to align or interlock with the tile with which they are to be laid

EXAMPLE ridge tiles, hip tile, valley tile, verge tile, angle tiles

3.3 Definitions specific to tiles and fittings with sidelock and headlock and tiles with sidelock only

3.3.1 General

3.3.1.1
interlock
system designed for the assembly of two adjoining tiles or fittings and usually including one or more raised parts called "ribs" and one or more concave parts called "grooves"

3.3.1.2
longitudinal interlock
system allowing two tiles or fittings in the same horizontal course to be fitted together

3.3.1.3
transverse interlock
system allowing two tiles or fittings from successive horizontal courses to be fitted together

Note 1 to entry: Three examples of interlock are shown in Figure 1. The arrangement of ribs and grooves limits the extent of movement between the tiles and improves the resistance to the ingress of water.

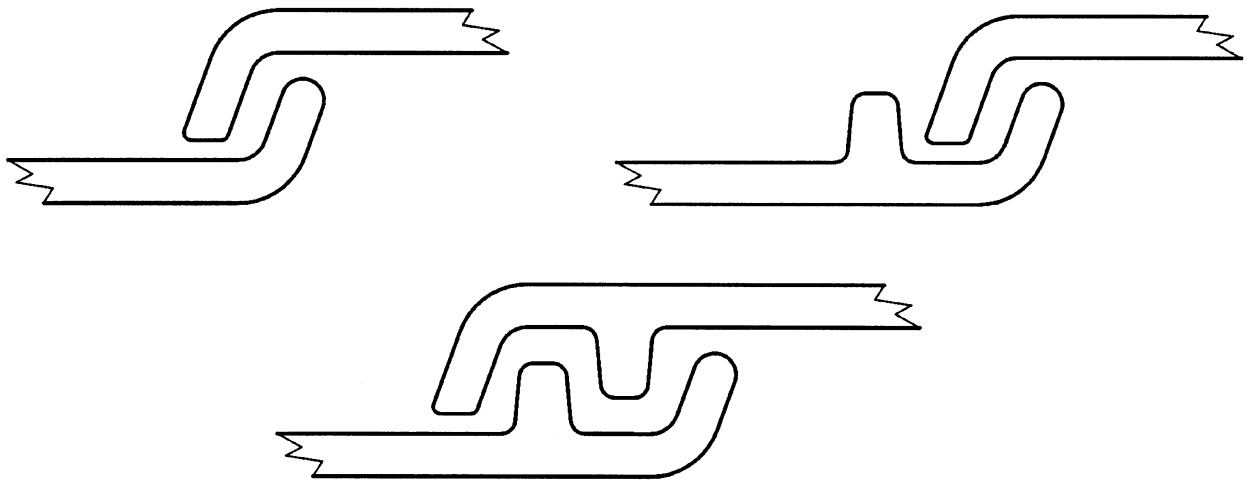


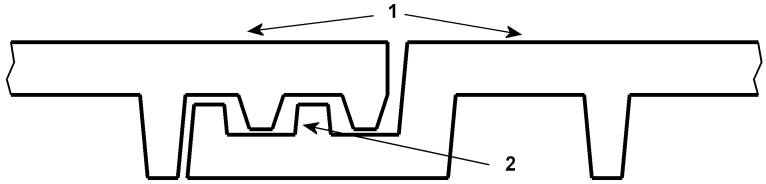
Figure 1 — Examples of interlock

3.3.2
straight bond tiles and fittings
tiles or coordinated fittings designed to be laid so that the longitudinal joints of successive courses are aligned

3.3.3
broken bond tiles and fittings
tiles or coordinated fittings designed to be laid so that the longitudinal joints are shifted half a tile between successive courses

Note 1 to entry: Certain types of tiles or coordinated fittings are designed to be laid either straight bonded or broken bonded.

3.3.4
flat interlocking tiles and fittings
interlocking tiles or coordinating fittings whose visible surface has no rib separating the areas of water flow from the longitudinal interlocks and where the longitudinal interlocks lie below the areas of water flow (see Figure 2)



Key

1 areas of water flow
2 interlock

Figure 2 — Cross section and diagram of principle

3.4 Definitions specific to over and under tiles

3.4.1
under tiles
tiles designed to be laid with their concave side facing upward and resting on the roofing support

Note 1 to entry: Under tiles may have no nib, or one or more nibs for laying on battens.

3.4.2
over tiles
tiles designed to be laid with their concave side facing downward and straddling two under tiles

Note 1 to entry: In general, the same units are used as under tiles when laid with their concave side facing upward and over tiles when they are laid with their concave side facing downward. However, the profile of under tiles can differ from that of over tiles; they can have, for example, a flat base or a shape allowing for the seating of the product on its support. In the latter case, under tiles are equipped with two lateral upright sides.

3.4.3
over and under tiles with lugs to fix the headlap
over and under tiles with lugs to fix the longitudinal overlap

3.5 Further definitions

3.5.1
additive
material added in small quantities to the clay mix so as to facilitate the manufacture of the tile or fitting or to improve its characteristics

3.5.2
efflorescense
crystalline deposit of soluble salts found on the surface of tiles or fittings due to water migrating from within the tiles or fittings and evaporating on the surface

3.5.3 Ceramic coating

3.5.3.1
glaze
glass-based fired coating, or the material used to obtain this effect

3.5.3.2
engobe
permeable or impermeable clay-based fired coating or the material used to obtain this effect

3.5.4
treatments
factory-applied hydrophilic or hydrophobic agents, which change the behaviour of the surface of the clay roofing tiles or fittings when it is wetted by water

3.5.5
crack
more or less regular crack not running throughout the entire thickness of the product

3.5.6
colour variation
variation in tone within one colour or within different colours in one production batch

Note 1 to entry: See also Annex B.

3.5.7
surface features
hollows, raised areas, spots or colours, etc. characterising an entire batch and produced specifically for aesthetic purposes (to imitate the appearance of old tiles, for example)

Note 1 to entry: See also Annex B.

3.5.8
clay fold
interruption of continuity affecting only the surface of the product, caused by the formation of a fold during pressing

Note 1 to entry: See also Annex B.

3.5.9 Overlap dimensions

3.5.9.1 General

3.5.9.1.1
gauge
length of the exposed part of the fixed tile or coordinated fitting, measured longitudinally

Note 1 to entry: This is the same as the batten gauge.

3.5.9.1.2
gauge declared by the manufacturer
mean value or two extreme values of the gauge as defined above, see 3.5.9.1.1

3.5.9.2 General

3.5.9.2.1
cover width
width of the exposed part of the tile or coordinated fitting as laid

3.5.9.2.2
cover width declared by the manufacturer
mean value or two extreme values of the cover width as defined above, see 3.5.9.2.1

3.5.10
camber
deviation from a straight line

Note 1 to entry: For plain tiles and interlocking tiles, camber is expressed as the deviation from a straight line, either longitudinally or transversally measured at the tile edge.

Note 2 to entry: For over and under tiles, camber is expressed as the deviation from a straight line measured, along the generatrix located in the bottom of the tile's concavity.

3.5.11
stratification
presence in the body of strata, possibly of different colours which may go through the thickness of the body

Note 1 to entry: See also Annex B.

3.5.12
nib
raised part at the back of the tile or fitting, used to hook it on the underlying supporting structure, generally battens

3.5.13
body of the tile or fitting
ceramic material making up the fired product

3.5.14
crazing (glaze or engobe)
cracking affecting only the thickness of the glaze or engobe or the vitrified surface of a product obtained by intense reduction, and not endangering the adhesion of the glaze or engobe to the body of the product

Note 1 to entry: See also Annex B.

3.5.15
fixing hole
hole, which is open or easily opened without damaging the product, designed for fixing the product to the underlying supporting structure

3.5.16
underside fixing hole
open hole, made in a raised area on the underside of the tile and designed to fix the tile to the support with an appropriate device

3.5.17 Structural faults

3.5.17.1
break
structural fault consisting of a separation of the product into two or more fragments

3.5.17.2
structural crack
structural fault consisting of a more or less regular crack running throughout the entire thickness of the product and visible to the naked eye

3.5.17.3
loss of nib
structural fault corresponding to the complete loss of the nib in a product designed with one nib only

3.5.18 Surface faults

3.5.18.1
blistering
superficial fault occurring during manufacture, consisting of superficial localised raising of material with a mean dimension of the surface area of over 10 mm

3.5.18.2
pit
superficial fault consisting of a fraction of material detached from the body of the product on the visible surface of the product with a mean dimension of over 7 mm

Note 1 to entry: This is often due to the expansion of a particle of, for example, chalk or pyrites.

3.5.18.3
chip
superficial fault consisting of a fraction of material detached from the body of the product with a mean dimension of over 7 mm, on the visible surface of the product

3.5.19
family
group of products for which the test results for one or more characteristics from any one product within the family are valid for all other products within the family

4 Requirements

4.1 Structural characteristics

There shall be no manufacturing faults which prevent the proper fitting together of the products, nor any structural faults as defined in 3.5.17.

For evaluation of structural characteristics, the products shall be examined with the naked eye at a distance of 30 cm to 40 cm, under normal lighting.

The products tested shall comply with the acceptance criteria given in Table A.1 and Table A.3.

NOTE Comments on appearance characteristics are given in Annex B.

4.2 Fixing

Tiles and fittings may be provided with nibs and/or fixing holes but other means of fixing are permitted.

NOTE 1 Over and under tiles do not necessarily have a nib.

NOTE 2 Codes of practice in certain countries recommend two nail holes for certain types of tiles.

When tiles and fittings are used as vertical cladding, they shall have appropriate means by which they may be fixed to an underlying support.

4.3 Geometric characteristics

4.3.1 General

The geometric requirements are not applicable to uncoordinated clay fittings and special tiles.

For the coordinated fittings only the relevant geometric characteristics that are necessary for their proper installation have to be determined.

4.3.2 Regularity of shape

4.3.2.1 Twist in relation to plain tiles and fittings, tiles and fittings with sidelock and headlock, tiles and fittings with sidelock only and overlapping tiles and fittings

The mean value of the coefficients of twist calculated as described in EN 1024 shall comply with the requirements stated in Table 1.

Table 1 — Requirements for the mean value of coefficient of twist

Tiles or fittings with total length mm	Coefficient of twist Limit value %
$>$ 300	$\leq$ 1,5
$\leq$ 300	$\leq$ 2,0

4.3.2.2 Uniformity of the transverse profile of over and under tiles and fittings

The uniformity of the transverse profile of over and under tiles is evaluated by measuring the width of the narrow and wide parts of the tile. The difference between the largest and the smallest values of the width as set out in EN 1024 and measured at the narrow end of the tile, as well as the difference between the largest and the smallest values of the width measured at the wide end of the tile, shall not exceed 15 mm.

4.3.3 Camber

4.3.3.1 Tiles and fittings with sidelock and headlock, tiles and fittings with sidelock only and overlapping tiles and fittings, over and under tiles and fittings

The mean value of the longitudinal camber calculated as described in EN 1024 shall comply with the requirements stated in Table 2.

Table 2 — Requirement for the mean value of longitudinal camber

Tiles or fittings with total length mm	Longitudinal camber Limit value %
> 300	≤ 1,5
≤ 300	≤ 2,0

4.3.3.2 Plain tiles and fittings

The mean value of the longitudinal and transverse cambers calculated as described in EN 1024 shall comply with the requirements stated in Table 3.

Table 3 — Requirements for the mean value of longitudinal and transverse camber

Tiles or fittings with total length mm	Longitudinal and transverse camber Limit value %
> 300	≤ 1,5
≤ 300	≤ 2,0

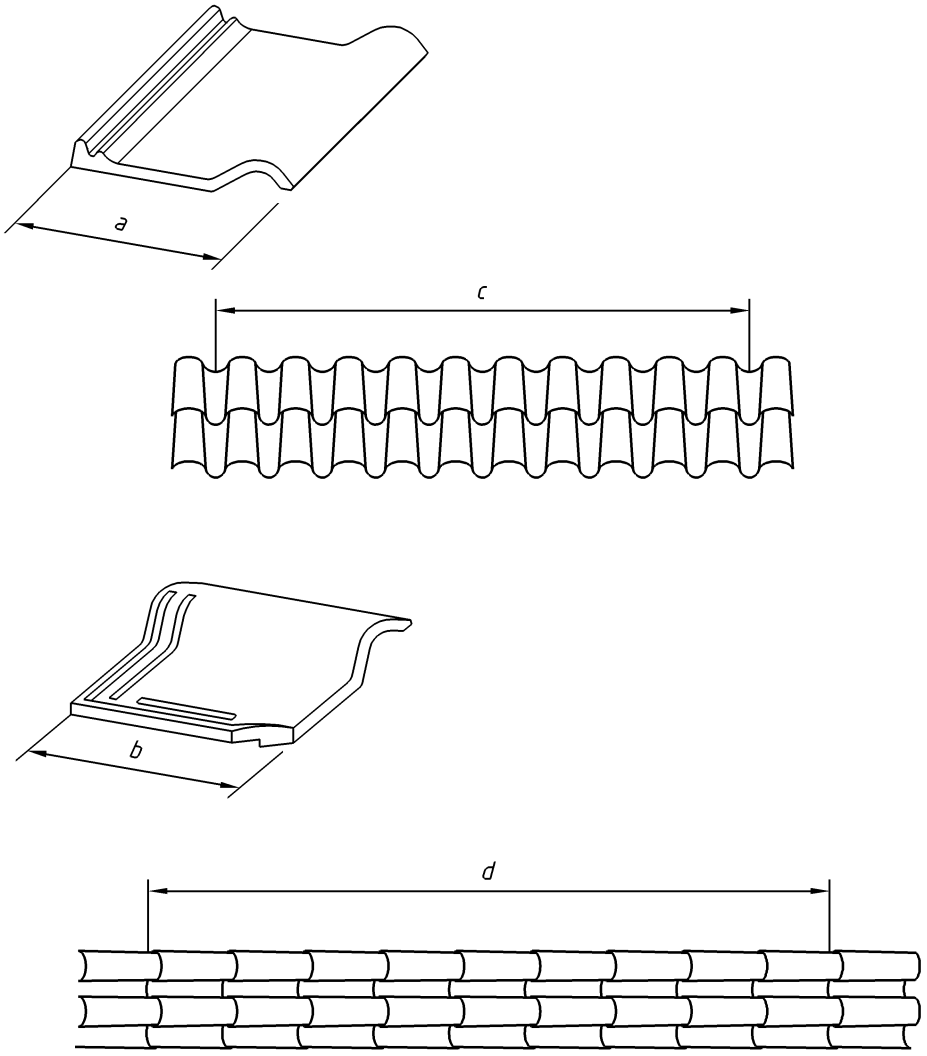
4.3.4 Dimensions and dimensional tolerances

4.3.4.1 General

Individual dimensions or cover dimensions shall be measured according to the methods described in EN 1024.

For tiles and coordinated fittings with sidelock and headlock, and tiles or coordinated fittings with sidelock only (for the latter, in the transverse direction only), the manufacturer may choose between the declaration of the individual dimensions (a,b) or the cover dimensions (c,d), see Figure 3.

Conformity to this document will thus be assessed with respect to the characteristic chosen by the manufacturer. For over and under tiles with lugs to fix the headlap, the manufacturer shall declare the minimal overlapped dimension (L2 according to EN 1024). For all other tiles or coordinated fittings, the measurements declared by the manufacturer shall be of individual products.



Key

a and b: Dimension of an individual product

c and d: Dimension of an overlapped group of products

Figure 3 — Example of determination of the tile dimensions

4.3.4.2 Individual dimensions

The mean values of the length and width of tiles, measured according to the methods described in EN 1024, shall fall within ± 2,0 % of the values declared by the manufacturer.

This requirement does not apply to the width of over and under tiles.

4.3.4.3 Cover dimensions (gauge)

The measured value of the mean cover dimension shall fall within ± 2,0 % of the cover dimension declared by the manufacturer.

For tiles with sidelock and headlock with a variable longitudinal gauge, the measured maximum gauge shall not be smaller than that declared by the manufacturer.

For tiles with sidelock and headlock with a variable transverse gauge, the measured maximum transverse cover dimension shall not be smaller than that declared by the manufacturer.

When relevant for variable gauge tiles the manufacturer may declare the minimum headlap.

When the manufacturer declares the minimum headlap, the measured minimum longitudinal gauge shall not exceed that declared by the manufacturer.

4.4 Physical and mechanical characteristics

4.4.1 Impermeability

4.4.1.1 General

After carrying out the test in accordance with Method 1 or Method 2 as described in EN 539-1:2005, the clay tiles and fittings shall be classified in one of the two impermeability categories given in descending order below. Tiles or fittings for roofs classified in Category 2 shall only be used with watertight roofing underfelt.

The manufacturer shall state which method he uses for his tests and the results shall be evaluated with reference to that method.

4.4.1.2 Category 1

a) Test method 1

The mean impermeability factor for test pieces after testing shall be 0,5 cm^3/cm^2 per day or less, and all individual results shall be 0,6 cm^3/cm^2 per day or less.

b) Test method 2

The mean impermeability coefficient for test pieces after testing shall be 0,8 or less, and all individual results shall be 0,85 or less.

4.4.1.3 Category 2

a) Test method 1

The mean impermeability factor for test pieces after testing shall be 0,8 cm^3/cm^2 per day or less, and all individual results shall be 0,9 cm^3/cm^2 per day or less.

b) Test method 2

The mean impermeability coefficient for test pieces after testing shall be 0,925 or less, and all individual results shall be 0,95 or less.

4.4.2 Flexural strength

The flexure strength criteria are not applicable to fittings.

The test pieces shall be considered satisfactory if, when subjected to the test method described in EN 538, they support without breaking a load of at least:

— 600 N for plain tiles,

— 900 N for flat interlocking tiles,

— 1 000 N for under and over tiles,

— 1 200 N for other types of tiles.

4.4.3 Frost resistance

After carrying out the test in accordance with EN 539-2, the clay tiles and fittings shall be classified in one of these levels:

Level 1 (150 cycles): minimum 150 cycles. If after 150 cycles none of the tiles shows any of the damage described as unacceptable according to EN 539-2:2013, Table 1.

Level 2 (90 cycles): minimum 90 cycles. If after 90 cycles none of the tiles shows any of the damage described as unacceptable according to EN 539-2:2013, Table 1.

Level 3 (30 cycles): minimum 30 cycles. If after 30 cycles none of the tiles shows any of the damage described as unacceptable according to EN 539-2:2013, Table 1.

Except for countries already listed in Annex C with only one level, CEN members should state in a national annex which level(s) is (are) applicable..

NOTE The different physical and mechanical characteristics mentioned above are independent of one another; thus a high water absorption measured for one tile does not necessarily imply that this tile has a low frost resistance, and *vice versa*.

4.5 Fire performance

4.5.1 External fire performance

4.5.1.1 Requirements

Where subject to regulatory requirements or where the manufacturer wishes to declare the external fire performance of clay roofing tiles and fittings for pitched roof coverings, the products shall be evaluated according to the provisions of 4.5.1.2 or 4.5.1.3.

4.5.1.2 Products satisfying the requirements for external fire performance, without the need for testing

Products covered by this document meet the requirements for external fire performance, without the need for testing, in Class B_{roof} (for all test methods) provided that they satisfy the definitions given in Commission Decision 2000/553/EC (1), i.e.:

— they satisfy the provisions of Commission Decision [96/603//EC (2)] and

— any external coating are inorganic.

For this purpose the calorific value or mass of the organic coating shall be measured over the coated area only.

Member States may have national “deemed to satisfy” lists, which include more products than those given in Decision 2000/553/EC.

4.5.1.3 Other products

Products not covered by 4.5.1.2 shall be tested and classified, using the method valid in the country of use of the products, in accordance with the provisions of EN 13501-5. The products to be tested shall be installed, in addition to the general provisions given in the test methods, in a manner representative of their intended end use.

4.5.2 Reaction to fire performance

4.5.2.1 Requirements

Where subject to regulatory requirements or where the manufacturer wishes to declare the reaction to fire of the products (e.g. where subject to regulatory requirements), the products shall be evaluated according to the provisions of 4.5.2.2 or 4.5.2.3.

4.5.2.2 Products satisfying the requirements for the fire reaction Class A1, without the need for testing

Tiles and fittings are classified Class A1 for the characteristic reaction to fire, in accordance with the provisions of Commission Decision [96/603/EC (2)], as amended, without the need for testing, provided that:

— for tiles and fittings made by gluing one or more clay components together, the organic content of the hardened glue is ≤ 0,1 % by weight or volume (whichever is the lower) and

— they contain ≤ 1,0 % by weight or volume (whichever is the lower) of homogeneously distributed organic material (other than glue).

4.5.2.3 Other products

Products not meeting the requirements of 4.5.2.2 shall be tested and classified in accordance with EN 13501-1. The products to be tested shall be installed, in addition to the general provisions given in the test method(s) and where appropriate, in a manner representative of their intended end use.

4.6 Dangerous substances

National regulations on dangerous substances may require verification and declaration on release, and sometimes content, when construction products covered by this European Standard are placed on those markets.

In the absence of European harmonised test methods, verification and declaration on release/content should be done taking into account national provisions in the place of use.

NOTE An informative database covering European and national provisions on dangerous substances is available at the Construction web site on EUROPA accessed through: *http://ec.europa.eu/enterprise/construction/cpd-ds/*.

5 Marking and labelling

At least 50 % of all types of tile and at least 10 % of fittings delivered shall bear indelible and legible marking (in code or in full) enabling the identification of:

— manufacturer and the factory,

— type of product (optional),

— country of origin,

— year and month of production.

The delivery documents shall refer to this EN 1304 and specify the impermeability Category 1 or Category 2 plus the test method used according to EN 539-1 and the level of frost resistance and the number of cycles the product has successfully passed.

The technical literature describing the product shall also state the dimensions and the declared camber or cambers, when relevant.

6 Evaluation of conformity

6.1 General

The compliance of the tiles and fittings covered by this document with the requirements of this document and with the stated values and classes (including method(s) and category) shall be demonstrated by:

— initial type testing;

— factory production control by the manufacturer.

For the purposes of initial type testing and factory production control, the tiles and/or fittings may be grouped into families where it is considered that test results for the selected characteristic(s) from one product within the family are valid for all tiles and/or fittings within that family.

6.2 Initial type testing

Initial type testing shall be performed to show conformity with this document according to Table A.1. and Table A.2.

Tests previously performed in accordance with the provisions of this document (same product, same characteristic(s), test method, sampling procedure, system of attestation of conformity, etc.) may be taken into account. In addition, initial type testing shall be performed at the beginning:

— of the production of a new tile or fitting (unless a member of the same family),

— of a new method of production (where this may affect the stated properties).

Whenever a change occurs in the product design, the raw material or the production process (subject to the definition of a family), which may change significantly one or more of the characteristics, the type tests or assessments shall be repeated for the appropriate characteristic(s).

NOTE If tests are carried out on tiles taken from a site after the delivery, only the test results for the geometric and impermeability criteria can be used without interpretation.

6.3 Factory production control

The manufacturer shall establish, document and maintain an FPC system to ensure that the products placed on the market are in conformity with the requirements in this document. The FPC system shall consist of procedures, regular inspections and tests and/ or assessments. The permanent internal control of production and of the finished product exercised by the manufacturer shall be documented in a systematic manner in the form of written policies and procedures and include the necessary corrective action if a non conformity occurs.

The manufacturer may choose different methods:

— minimum frequency of product tests for Factory Production Control as given in Table A.3,

— statistical method, where the level of the compliance of the product and/or process shall be declared and demonstrated by the manufacturer.

Alternative test methods may be used for FPC provided that a satisfactory statistical correlation can be demonstrated with the test methods specified in this document.

NOTE 1 Statistical schemes (e.g. ISO 2859-1) provide the possibility to satisfy the FPC requirements.

For the characteristics external fire performance and reaction to fire, and where the product is subject to evaluation by testing, FPC shall consist of controls on raw materials and the production process, at a frequency, to be stated in the manufacturer's FPC manual, sufficient to ensure that products remain the same as those subjected to initial type testing.

NOTE 2 Manufacturers having an FPC system which complies with EN ISO 9001 [3] and which addresses the requirements of this document are recognised as satisfying the FPC requirements.

6.4 Sampling

6.4.1 Sampling of tiles

6.4.1.1 Sampling of a consignment

When sampling a consignment of tiles to demonstrate that the consignment complies with the requirement of this document, the tiles shall be chosen from positions throughout the consignment without consideration being given to the condition or quality of the selected tiles.

6.4.1.2 Sampling for initial type testing and factory production control

The tiles may be selected from the production process or the finished products in accordance with the method of factory production control adopted by the manufacturer. The samples shall be chosen without consideration being given to the condition or quality of the selected tiles.

6.4.2 Sampling of fittings

6.4.2.1 Sampling of a consignment

When sampling a consignment of fittings, all the types of fittings may be grouped into families according to the definition in 3.5.19. Fittings shall be sampled in accordance with the principle of 6.4.1.1.

6.4.2.2 Sampling for initial type testing and factory production control

For type testing and factory production control of the fittings, the fittings may be grouped into families according to the definition in 3.5.19. Fittings shall be sampled in accordance with the principle of 6.4.1.2.

Annex A
(normative)

Initial type testing and frequency of product tests for factory production control

Table A.1 and Table A.2 give details of sampling and compliance criteria for initial type testing and Table A.3 gives similar details for factory production control.

Table A.1.— Number of samples and number of permissible faulty products or mean test results per test for initial type testing

Characteristic	Number of samples	Number of permissible faulty products or mean test results per test
Structure	100	5
Regularity of shape	See EN 1024	0
Camber	See EN 1024	0
Dimensions	See EN 1024	0
Impermeability	See EN 539-1	0
Flexural strength	See EN 538	0
Frost resistance	See EN 539-2	0

Table A.2 — Additional initial type testing, when relevant (see 4.5.1.3 and 4.5.2.3)

Characteristic	References
External fire performance	See EN 13501-5
Reaction to fire	See EN 13501-1

Table A.3 — Number of samples and number of permissible faulty products or mean test results per test for factory production control

Characteristic	Number of samples	Frequency	Number of permissible faulty products or mean test results per test
Structure	100	1 per day	5
Regularity of shape	See EN 1024	1 per fortnight	0
Camber	See EN 1024	1 per fortnight	0
Dimensions	See EN 1024	1 per fortnight	0
Impermeability	See EN 539-1	1 per quarter	0
Flexural strength	See EN 538	1 per year	0
Frost resistance	See EN 539-2	1 per year	0

Annex B
(informative)

Appearance

Because the functional properties of the products are considered elsewhere, the only purpose of this annex is to describe the characteristics that are inherent in the ceramic fabrication process that might have an influence on the overall appearance of the roofing.

Surface features and clay folds described in 3.5.7 and 3.5.8 are not considered as defects. The same applies to any scratches, scrapes and signs of friction that appear on tiles during manufacture, packing, handling or transport.

Crazing and stratification of the body of the tile which do not jeopardise the requirements of 4.4 are not considered to be defects.

Colour variations within one batch, affecting the whole of that batch and produced specifically for aesthetic reasons, are permissible.

For tiles of one single colour, variations in colour due to the ceramic process itself are accepted.

Some tiles can display a very fine white film on their upper surface shortly after laying, which affects, to a varying degree, the normal colour of that surface. In most cases, this temporary efflorescence will fade and gradually disappear from the outer surface of the product as a result of atmospheric precipitation, and will not affect the functional properties of the tiles concerned.

Annex C
(informative)

Level(s) of frost resistance and number of cycles applicable in different countries

Country	Level of frost resistance	Number of cycles
Austria, Belgium, Denmark, France, Germany, Hungary Netherlands, Poland, Spain, Switzerland and United Kingdom	1	150
Italy, Spain, Portugal and Greece	2	90
-	3	30

Where a country is not listed above, and where testing is required, the product should be tested in accordance with level(s) valid in that country.

Annex ZA
(informative)

Clauses of this European Standard addressing the provisions of the EU Construction Products Directive

ZA.1 Scope and relevant clauses

This European Standard has been prepared under the following Mandates given to CEN by the European Commission and the European Free Trade Association:

— M/121 "Internal and external wall and ceiling finishes", and

— M/122 "Roof coverings, roof lights, roof windows and ancillary products".

The clauses of this European Standard shown in this annex meet the requirements of the Mandates given under the EU Construction Products Directive (89/106).

Compliance with these clauses confers a presumption of fitness of the clay roofing tiles and fittings covered by this European Standard for the intended uses indicated herein; reference shall be made to the information accompanying the CE marking.

This annex establishes the conditions for the CE marking of clay roofing tiles and fittings intended for use:

— externally, to produce pitched roof or wall coverings for buildings, or

— internally, to produce a wall finish for buildings,

indicated in Tables ZA.1.1, ZA.1.2 and ZA.1.3 and shows the relevant clauses applicable. This annex has the same scope as the relevant part in Clause 1 of this European Standard related to the aspect covered by the mandate, and is defined by Tables ZA.1.1, ZA.1.2 and ZA.1.3.

Table ZA.1.1 — Relevant clauses for clay roofing tiles and fittings used for roof coverings

Product : clay roofing tiles and fittings **Intended use :roof covering**			
Essential characteristic from Mandate M/122	**Requirement clauses in this European Standard**	**Mandated levels and/or classes**	**Notes**
Mechanical resistance	4.4.2		Pass/fail
External fire performance	4.5.1	See EN 13501-5	Declared class Includes deemed to satisfy products without the need for testing
Reaction to fire	4.5.2	Classes A1 to F	Declared class Includes deemed to satisfy Class A1 products without the need for testing
Water impermeability	4.4.1		Declared category and test method
Dimensions and dimensional tolerance	4.3.4		Pass/fail
Durability	4.4.3		Declared Level and the number of cycles in brackets
Release of regulated substances	4.6		

Table ZA.1.2 — Relevant clauses for clay roofing tiles and fittings used for internal wall lining

Product : clay roofing tiles and fittings **Intended use :internal wall lining**			
Essential characteristic from Mandate M/121	**Requirement clauses in this European Standard**	**Mandated levels and/or classes**	**Notes**
Reaction to fire	4.5.2	Classes A1 to F	Declared class Includes deemed to satisfy Class A1 products without the need for testing
Water impermeability	4.4.1		Declared category and test method
Release of regulated substances	4.6		

Table ZA.1.3 — Relevant clauses for clay roofing tiles and fittings used for external wall cladding

Product : clay roofing tiles and fittings **Intended use :external wall**			
Essential characteristic from Mandate M/121	**Requirement clauses in this European Standard**	**Mandated levels and/or classes**	**Notes**
Reaction to fire	4.5.2	Classes A1 to F	Declared class Includes deemed to satisfy Class A1 products without the need for testing
Water impermeability	4.4.1		Declared category and test method
Durability	4.4.3		Declared Level and the number of cycles in brackets
Release of regulated substances	4.6		

A requirement for any particular characteristic does not apply in those Member States where there are no regulatory requirements for that characteristic covering the intended use of the product. In this case, manufacturers placing their products on the market of these Member States are not obliged to determine nor declare the performance of their products with regard to the characteristic and the option “No performance determined (NPD)" in the information accompanying the CE marking (see ZA.3) may be used. The NPD option may not to be used, however, where the characteristic is subject to a threshold level.

ZA.2 Procedure for attestation of conformity of clay roofing tiles and fittings

ZA.2.1 Systems of attestation of conformity

The systems of attestation of conformity of clay roofing tiles and fittings indicated in:

— Tables ZA.1.1 in accordance with the Decision of the Commission 98/436/EC of 1998-06-22 (*see OJEU L194 of 1998-07-10*), as corrected (*see OJEU L278 of 1998-10-15*) and amended by 2001/596/EC of 2001-01-08 (*see OJEU L209 of 2001-08-02*), as given in Annex III of the mandate M122 for "Roof coverings, roof lights, roof windows and ancillary products",

— Tables ZA.1.2, in accordance with the Decision of the Commission 98/437/EC of 1998-06-30 (*see OJEU L194 of 1998-07-10*), as corrected (*see OJEU L278 of 1998-10-15*) and amended by 2001/596/EC of 2001-01-08 (*see OJEU L209 of 2001-08-02*) as given in Annex III of the mandate M121 for "Internal and external wall and ceiling finishes",

are shown in Table ZA.2 for the indicated intended uses and relevant levels or classes.

Table ZA.2 — Attestation of conformity systems for clay roofing tiles and fittings

Products	Intended uses	Level(s) or class(es)	Attestation of conformity systems
Clay roofing tiles and fittings	As roofing covering subject to reaction to fire regulations	A1*, A2*, B* and C*	1
		A1**, A2**, B**, C**, D and E	3
		(A1 to E)***, F	4
	As roof coverings subject to external fire performance regulations	Products requiring testing	3
		Products deemed to satisfy without testing	4
	As roof coverings subject to regulations on dangerous substances	–	3
	As roof coverings for all other uses	–	4
Clay roofing tiles and fittings	As internal or external finishes in walls or ceilings subject to reaction to fire regulations	A1*, A2*, B* and C*	1
		A1**, A2**, B**, C**, D and E	3
		(A1 to E)***, F	4
	As internal or external finishes in walls or ceilings, as relevant, subject to regulations on dangerous substances	–	3
	As internal or external finishes in walls or ceilings for all other uses mentioned in the mandate	–	4

* Products/materials for which a clearly identifiable stage in the production process results in an improvement of the reaction to fire classification (e.g. an addition of fire retardants or a limiting of organic material).

** Products/materials not covered by footnote (*).

*** Products/materials that do not require to be tested for reaction to fire (e.g. products/materials of Class A1 according to Commission Decision 96/603/EC).

System 1: See Directive 89/106/EEC (CPD) Annex III.2.(i), without audit testing of samples.

System 3: See Directive 89/106/EEC (CPD) Annex III.2.(ii), Second possibility.

System 4: See Directive 89/106/EEC (CPD) Annex III.2.(ii), Third possibility.

The attestation of conformity of the products in Tables ZA.1.1 to ZA.1.3 shall be based on the evaluation of conformity procedures indicated in Tables ZA.3.1 to ZA.3.3 resulting from application of the clauses of this European Standard indicated therein.

Table ZA.3.1 — Assignment of evaluation of conformity tasks for clay roofing tiles and fittings under system 1

Tasks		Content of the task	Evaluation of conformity clauses to apply
Tasks under the responsibility of the manufacturer	Factory production control (FPC)	Parameters related to all characteristics of Tables ZA.1.1 and/or ZA.1.2/ZA.1.3 relevant for the intended end use	6.3
	Initial type testing by a notified test laboratory	Release of dangerous substance if relevant.	6.2
	Initial type testing by the manufacturer	All characteristics of Table ZA.1.1 and/or ZA.1.2/ZA1.3 relevant for the intended use except reaction to fire performance and release of dangerous substances, as relevant	6.2
	Further testing of samples taken at factory according to the prescribed test plan	Essential characteristics of relevantTables ZA.1.1,ZA1.2/ZA1.3 relevant for the intended use which are declared	6.3
Tasks under the responsibility of the notified certification body	Initial type testing	Reaction to fire performance (Classes A1*, A2*, B*, C*) [a]	6.2
	Initial inspection of factory and of FPC	Parameters related to all characteristics of Table ZA.1.1 and/or ZA.1.2/ZA1.3 relevant for the intended use, namely reaction to fire	6.3
	Continuous surveillance, assessment and approval of FPC	Parameters related to all characteristics of Table ZA.1.1 and/or ZA.1.2/ZA.1.3 relevant for the intended use, namely reaction to fire	6.3
[a] See footnote (*) to Table ZA.2.			

Table ZA.3.2 — Assignment of evaluation of conformity tasks for clay roofing tiles and fittings under system 3

Tasks		Content of task	Evaluation of conformity clauses to apply
Tasks under the responsibility of the manufacturer	Factory production control (FPC)	Parameters related to all relevant characteristics of Tables ZA.1.1, ZA.1.2 and/or ZA.1.3	6.3
	Initial type testing by the manufacturer	Those relevant characteristics of Tables ZA.1.1, ZA.1.2 and/or ZA.1.3 not tested by the notified body	6.2
	Initial type testing by a notified test laboratory	External fire performance (when tested), reaction to fire (when tested) and release of dangerous substances	6.2

Table ZA.3.3 — Assignment of evaluation of conformity tasks for clay roofing tiles and fittings under system 4

Tasks		Content of task	Evaluation of conformity clauses to apply
Tasks under the responsibility of the manufacturer	Factory production control (FPC)	Parameters related to all relevant characteristics of Tables ZA.1.1, ZA.1.2 and/or ZA.1.3	6.3
	Initial type testing by the manufacturer	Those relevant characteristics of Tables ZA.1.1, ZA.1.2 and/or ZA.1.3, i.e. mechanical resistance, water impermeability, dimensional variations and durability, as appropriate	6.2

ZA.2.2 EC Declaration of conformity

For products under system 1

When compliance with the conditions of this annex is achieved, the certification body shall draw up a certificate of conformity (i.e. EC certificate of conformity), which entitles the manufacturer to affix the CE marking. The certificate shall include:

— name, address and identification number of the certification body,

— name and address of the manufacturer, or his authorised representative established in the EEA, and place of production,

NOTE 1 The manufacturer may also be the person responsible for placing the product onto the EEA market, if he takes responsibility for CE marking.

— description of the product (type, identification, use, ...),

— provisions to which the product conforms (i.e. Annex ZA of this EN),

— particular conditions applicable to the use of the product (e.g. provisions for use under certain conditions),

— the number of the certificate,

— conditions of validity of the certificate, where applicable,

— name of, and position held by, the person empowered to sign the certificate.

For products under system 3

When compliance with the conditions of this annex is achieved, the manufacturer or his/her agent established in the EEA shall prepare and retain a declaration of conformity (EC Declaration of Conformity) which entitles affixing the CE marking. This declaration shall include:

— name and address of the manufacturer, or his/her authorised representative established in the EEA, and place of production,

NOTE 2 The manufacturer may also be the person responsible for placing the product onto the EEA market, if he takes responsibility for CE marking.

— description of the product (type, identification, use, etc.,) and a copy of the information accompanying the CE marking,

NOTE 3 Where some of the information required for the Declaration is already given in the CE marking information, it does not need to be repeated.

— provisions to which the product conforms (i.e. Annex ZA of this European Standard),

— particular conditions applicable to the use of the product (e.g. provisions for use under certain conditions),

— name and address of the notified laboratory(ies),

— name of and position held by the person empowered to sign the declaration on behalf of the manufacturer or his authorised representative.

For products under system 4

— name and address of the manufacturer, or his/her authorised representative established in the EEA, and place of production,

NOTE 4 The manufacturer may also be the person responsible for placing the product onto the EEA market, if he takes responsibility for CE marking.

— description of the product (type, identification, use, etc.,) and a copy of the information accompanying the CE marking,

— provisions to which the product conforms (i.e. Annex ZA of this European Standard),

— particular conditions applicable to the use of the product (e.g. provisions for use under certain conditions),

— name of and position held by the person empowered to sign the declaration on behalf of the manufacturer or his authorised representative.

The declaration shall be presented in the language or languages accepted in the Member State in which the product is to be used.

ZA.3 CE marking

The manufacturer or his authorised representative established within the EEA is responsible for the affixing of the CE marking. The CE marking symbol shall be in accordance with Directive 93/68/EEC and shall be shown on the packaging and/or on the accompanying commercial documents. The following information and characteristics shall accompany the CE marking symbol (where relevant):

— name or identifying mark of the producer/supplier, and

— last two digits of the year in which the marking was affixed, and

— number of this European Standard (EN 1304) with date of version, and

— product type (e.g. type of clay roofing tiles or fittings for roof and/or external or internal wall covering), and

— information on the relevant essential characteristics in Tables ZA.1.1, ZA.1.2 and/or ZA.1.3:

  — the manufacturer may declare "complies" or higher performance levels for mechanical resistance and dimensional variation,

  — water impermeability (the test method 1 or 2 and the Category 1 or 2),

  — durability resistance (the level of frost resistance and the number of cycles in brackets),

— the manufacturer may declare "Deemed-to-satisfy Class A1", give the test result (with mounting and fixing conditions, where relevant) or declare Class F for reaction to fire, and "Deemed-to-satisfy" (for products of Class B_{roof}), Class F_{roof} or give the test result (with mounting and fixing conditions, where relevant) for external fire performance.

Where a tile or fitting is intended for more than one end use (roof, external or internal wall), the information on relevant characteristics may be combined.

The “No performance determined” (NPD) option may not be used for durability and where the characteristic is subject to a threshold level. Otherwise, the NPD option may be used when and where the characteristic, for a given intended use, is not subject to regulatory requirements in the Member State of destination.

Figure ZA.1 gives an example of the information to be given on the packaging and/or on the accompanying commercial documents for clay roofing tiles, type plain tile, intended for both roof covering and external or internal wall claddings, in reaction to fire Class A1 deemed to satisfy and which therefore come under attestation system 4.

CE		*CE conformity marking, consisting of the "CE"-symbol given in Directive 93/68/EEC*
Anyco Ltd, P O Box 21, B105000		*Name or identifying mark and registered address of the producer*
13		*Last two digits of the year in which the marking was affixed*
EN 1304:2013 Clay roofing tiles type plain tile for roof covering, external wall cladding or internal wall lining		*No. of European Standard with date of version* *Description of product*
Mechanical resistance properties/flexural strength	Pass	*Information on regulated characteristics*
External fire performance	Deemed to satisfy	
Reaction to fire	A1	
Water impermeability	Pass category 1 test method 2	
Dimensions and dimensional variation	Pass	
Durability	Level 1 (150 cycles)	

Figure ZA.1 — Example CE marking information on the packaging or accompanying commercial documents

Bibliography

[1] 2000/553/EC, Commission Decision of 6 September 2000 implementing Council Directive 89/106/EEC as regards the external fire performance of roof coverings. *Official Journal n° L 235 of 19/09/2000, pages 19 – 22.*

[2] 1996/603/EC, Commission Decision of 4 October 1996 establishing the list of products belonging to Classes A1 'No contribution to fire' provided for in Decision 94/611/EC implementing Article 20 of Council Directive 89/106/EEC on construction products. *Official Journal n° L 267 of 19/10/1996, pages 23 – 26,* as amended.

[3] EN ISO 9001, *Quality management systems - Requirements (ISO 9001)*

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