BRITISH STANDARD

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Agglomerated stone — Terminology and classification

ICS 01.040.91; 91.100.15

BSI British Standards

National foreword

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

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Foreword

This document (EN 14618:2009) has been prepared by CEN/TC JWG 229/246 “Agglomerated stones”, the secretariat of which is held by UNI.

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1 Scope

This document specifies the terminology and classification of the agglomerated stone products. Agglomerated stone products are industrial products mainly made of hydraulic cement, resin or mixture of both, stones and other additions. They are industrially manufactured in geometrical shapes at fixed plants by moulding techniques. They are put on the market in the form of rough blocks, rough slabs, slabs, tiles, dimensional stone works, and any other cut to size products.

All other agglomerated stones products not intended to be used for flooring, wall finishes and similar uses (like drainage channels, structural elements, etc.) are excluded from the field of this standard.

This European Standard is not applicable to terrazzo tiles covered by EN 13748-1 [1] and EN 13748-2 [2].

2 Normative references

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

EN 12670:2001, *Natural stone — Terminology*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 12670:2001 and the following apply.

3.1
agglomerated stone
industrial product manufactured from a mixture of aggregates of various sizes and natures (generally coming from natural stones), sometimes mixed with other compatible materials, additions and binder

NOTE The binder could be resin, hydraulic cement or mixture of both (in various percentages). Aggregates consist of natural and/or recycled stones and/or different additions such as crushed ceramics, glass, mirrors. They are bound via resin and filler or cement and water or mixture of both. The manufacturing process is irreversible.

3.2
agglomerated stone product
semi-finished product manufactured from agglomerated stone in form of blocks or slabs, which can be transformed in finished slabs, tiles, vanity tops or similar elements.

NOTE Under the agglomerated stones term fall architectural elements, complementary to products for flooring and wall finishes, which can or cannot be subsequently cut to size. Products manufactured by the technology of the agglomerated stones could be impregnated by suitable chemicals in order to waterproof/seal open pores. The products can be also sealed with putty in order to fill in the surface defects accidentally present in some natural stones and other aggregates.

3.3
classification of agglomerated stones
classification according to the type of the binder and the nature of the aggregates of the agglomerated stone product

NOTE If the volume of the binding material is greater than the volume of the aggregates, the resulting material cannot be classified as agglomerated stone.

3.3.1
classification according to the type of the binder
classification according to the binder of the agglomerated stone product, i.e. resin, hydraulic cement or mixtures of resin and cement

NOTE Agglomerated stone product can be bound by resin (e.g. thermosetting resin) or by other suitable organic or inorganic polymer which can be irreversibly hardened

Agglomerated stone product can be bound by hydraulic cement (white or grey).

Agglomerated stone product can be bound by mixtures of resin and cement.

3.3.2
classification according to the mineral nature of the aggregates
classification according to the mineral nature of the agglomerated stone product, i.e. carbonate nature, silica nature or carbonate and silica nature

NOTE Agglomerated stone product can be constituted of aggregates of carbonate nature e.g. marble, limestone, etc.

Agglomerated stone product can be constituted of aggregates of silica nature e.g. quartz, sandstone, granite, etc.

Agglomerated stone product either of carbonate or of silica nature can contain aggregates such as crushed ceramics, glass, mirrors, etc.

Agglomerated stone product can be constituted of aggregates of both carbonate and silica nature.

4 Terminology of agglomerated stones

4.1 Terms of fragmented aggregates

4.1.1
natural aggregate
mixture of natural stone fragments which are derived either from incoherent rocks (sand) or fragmented coherent carbonate type rocks or silica-type rocks (granite, quartzite, etc.), and whose maximum linear size may be either 150 mm or more

NOTE 1 Calcium Carbonate: a solid, formula $CaCO_3$, occurring in nature as calcite and its polymorphous minerals.

NOTE 2 Carbonate: a chemical compound containing CO_3^{2-} group.

4.1.2
continuous particle size distribution
mixture of aggregates with a continuous particle size distribution scale up to a maximum value, depending on the nature of the material and the comminution method

4.1.3
de-powdered continuous particle size distribution
continuous particle size distribution without the fraction smaller than 0,2 mm

4.1.4
granite (commercial definition)
natural stone, compact and polishable, mainly consisting of minerals with a hardness between 5 and 7 on the Mohs scale

4.1.5
filler
finely ground powder usually below 45 µm used as a component in the formulation, to be coupled with the binding material to form the binding paste

4.1.6
particle size
predominant average diameter of particles in a mixture of aggregates

4.1.7
intermediate aggregate
mixture of aggregates which forms a restricted intermediate grain size fraction between the maximum selected size and generally 45 µm

4.1.8
limestone
sedimentary rock consisting chiefly of calcite, CaCO3

4.1.9
marble (commercial definition)
natural stone compact and polishable, mainly consisting of minerals with hardness between 3 and 4 on the Mohs scale

4.1.10
quartz
silicate mineral of the formula SiO_2

4.1.11
quartzite
methamorphic rock consisting essentially of quartz

4.1.12
sand
mineral sediment of size range 0,06 mm to 4 mm, commercially intended constituted by SiO_2

4.1.13
sandstone
sedimentary rock composed of grains from quartz, feldspath, mica and minor fragments from other rocks

4.1.14
selected aggregate
mixture of aggregates selected by classification with a grain size distribution subdivided into two pre-selected size ranges

4.1.15
sieve analysis
measurement of the grain size distribution by sieve selection and classification

4.1.16
silica
silicon dioxide (formula SiO_2)

4.2 Terms of paste components

4.2.1
accelerator (promoter)
chemical additive used to make faster the action of the initiator and, in general, the setting of the binder

4.2.2
additive
chemical product added to a mixture in small amount to obtain particular aesthetical or technical characteristics

4.2.3
binder
organic or inorganic chemical product used to bind via an irreversible process the aggregates and the filler in an agglomerated stone

4.2.4
gel
semi-solid or jellylike state of a thermosetting resin due to the partial reaction (cross-linking) of the polymer chains

4.2.5
impregnating product
organic material by which the stone agglomerate may be impregnated to improve the physical - mechanical product properties

4.2.6
inhibitor
chemical additive used to make slower the hardening in a thermosetting resin, so increasing its pot life

NOTE See 5.20.

4.2.7
initiator (hardener)
chemical additive able to make faster the hardening of a thermosetting resin

4.2.8
inorganic binding paste
mixture of inorganic binding material (generally Portland cement, white or grey), filler and mixing water

4.2.9
matrix
mixture of organic or inorganic binding paste, sometimes including the intermediate aggregates

4.2.10
mixture
mixture of the binding paste, and of the aggregates, including the additions of chemicals, and sometimes pigments and compatible materials

4.2.11
mortar
mixture of water, cement and sand (sometimes including chemical additives)

4.2.12
organic binding paste
mixture of organic binding material (generally a thermosetting resin) and the filler

4.2.13
pigment
substance, generally in the form of fine particles, which is insoluble in the application medium and whose sole purpose is to colour the matrix

4.2.14
cement
hydraulic binder used to form the inorganic binding paste, with water

NOTE See EN 197-1 [3].

4.2.15
putty
stiff paste sometimes used to fill cracks or holes (when present) in natural stones

4.2.16
resin
liquid chemical product, which can be a mixture constituted of polymers and monomers or a different organic molecule that can be hardened via chemical and/or thermal process without the possibility to be melted

5 Terminology of the manufacturing process

5.1
block squaring
see EN 12670:2001, 2.2.4

5.2
bush hammered finish
see EN 12670:2001, 2.3.8

5.3
calibrating, honing and polishing
automatic operation made by machines in a series to form an integrated line generally consisting of a feed belt and a number of honing/polishing heads with varying grit sizes

5.4
chamfering
operation by which the edges of the surface of a tile are bevelled and rectified

5.5
cement hydration
reaction between water and the cement which first conducts to mixture viscosity increase and subsequently to its hardening

5.6
cold curing
hardening reaction of a thermosetting resin which occurs, in presence of an initiator, for the action of an accelerator

5.7
cure
reaction of cross-linking or polymerization of the molecules of a resin which conducts to the transformation of a liquid resin to a hardened state

5.8
cure time
time required by the liquid resin to reach a cured or fully polymerized state after the initiator has been added

5.9
flamed finish
type of stone surface conditioning obtained by thermal treatment of the stone surface by a high temperature flame in a very short time

5.10
gel time
time required to change a flowable resin to a non-flowable gel condition

5.11
ground finish
surface treatment obtained by means of a grinding disk bonded with silicium carbide to produce a flat, uniform surface

5.12
hardening of a thermosetting resin
change in the physical properties of a fluid resin, obtained through a thermal or chemical reaction, by which the resin assumes a solid structure and develops mechanical strength

5.13
honed finish
surface treatment to obtain a dull polish or matt surface

5.14
hot curing
hardening reaction of a thermosetting resin which occurs, in presence of an initiator, for the temperature increase with or without the addition of the accelerator

5.15
matt finish
surface treatment obtained by means of a silicium carbide bonded polishing disk with grain size F 400, to produce a very flat, uniform, but not polished finish

5.16
moulding
operation by which through the application of mechanical pressure and/or vibration it is possible to compact the mixture constituted by the aggregates and the binding paste to the form of a mould

5.17
moulding under vacuum
operation by which the application of mechanical pressure and/or vibration is made at very low residual pressure (close to absolute vacuum)

5.18
open cast moulding
operation by which the application of vibration and/or mechanical pressure is made in open air

5.19
polished finish
surface treatment obtained by means of a polish disk or felt to produce a high gloss finish

5.20
pot life
time of workability of a cured resin

5.21
sand blasted finish
matt finishing resulting from the impact of sand or other abrasive grains expelled by a sand jet

5.22
sawn finish
finish resulting from the gang saw of the material without further treatment

5.23
surface treatment
application of certain materials (i.e. chemicals) to the exposed face of a slab

6 Terminology of the final product

6.1
block
basis of the usable agglomerated stone, consisting of a square rough block approximately corresponding to a regular parallelepiped

6.2
cladding slab
cut to size slab used for external and internal wall finishes, fixed to a structure either mechanically or by means of adhesives

6.3
dimensional stone work
stone element prepared to specific dimension for internal or external application e.g. skirting, window seals, tread, etc.

6.4
cut to size slab
flat-surfaced finished product obtained from rough slabs whose dimensions are given by length-width-thickness (in this order), expressed in millimetres

6.5
modular tile
piece of agglomerated stone in standard sizes, with dimensions (≤ 600 mm) x (≤ 600 mm) and nominal thickness from 6 mm to 20 mm

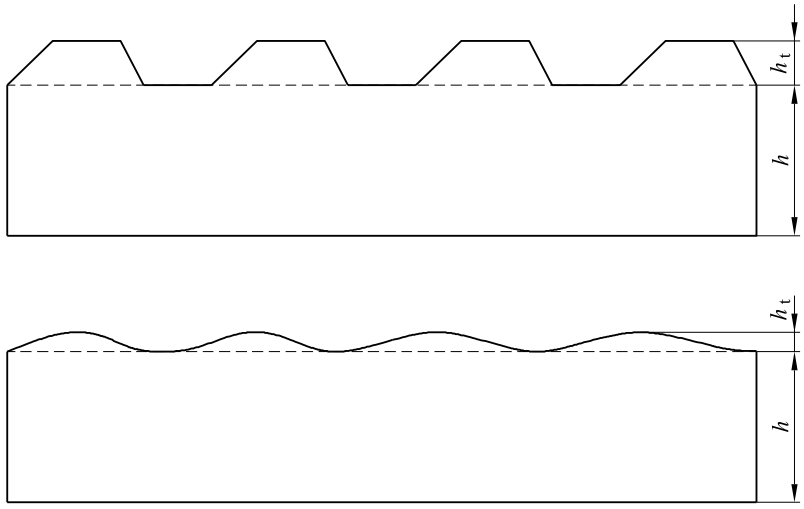
6.6
raised floor
slabs cut to size which form a floor where the single pieces are put on to a structure by means of supporting elements

6.7
slab
flat-surfaced semi-finished agglomerated stone product with edges obtained either by sawing from a block or by moulding, and whose size is given by nominal dimensions (length-width-thickness, in this order), expressed in millimetres

6.8
special piece
any other piece of different geometrical shape or cut to size for particular application (for example vanity tops, kitchen tops, slabs, etc.)

6.9
textured upper face slab
non-flat-surfaced semi-finished agglomerated stone product with ridges, grooves, curves or other surface features as shown in Figure 1

6.10
tile
agglomerated stone product obtained from a slab mould or by cutting a slab to a particular size



Key
h Thickness of the textured upper face slab
ht Thickness of the textured upper face

Figure 1 — Cross section examples of textured upper face slabs

Bibliography

[1] EN 13748-1, *Terrazzo tiles — Part 1: Terrazzo tiles for internal use*

[2] EN 13748-2, *Terrazzo tiles — Part 2: Terrazzo tiles for external use*

[3] EN 197-1, *Cement — Part 1: Composition, specifications and conformity criteria for common cements*

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