



SLOVENSKI STANDARD
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Precast concrete products - Concrete finishes - Identification

Produits préfabriqués en béton - Surface et parements de béton - Éléments d'identification

Ta slovenski standard je istoveten z: EN prCEN/TR 15739

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Precast concrete products - Concrete finishes - Identification

Produits préfabriqués en béton - Surface et parements de
béton - Éléments d'identification

This draft Technical Report is submitted to CEN members for Technical Committee Approval. It has been drawn up by the Technical Committee CEN/TC 229.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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Foreword

This document (prCEN/TR 15739:2007) has been prepared by Technical Committee CEN/TC 229 “Precast concrete products”, the secretariat of which is held by AFNOR.

This document is currently submitted to Technical Committee Approval.

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Introduction

The visual perception of concrete finishes is determined by characteristics which can vary to different extents, i.e. variations which are intentional (more or less). Intended variations imply that one is acquainted with the material and is able to vary the characteristic within limits set by oneself, without the variations being regarded as defects.

Finishes depend on manufacturing techniques such as:

Before casting

The finish is determined by the surface of the mould:

- smooth ex-mould finish,
- profiled from the mould,
- profiled/patterned from a lining in the mould,
- cast-on elements,
- use of retarders.

Mould-hardened off-the-form finish

As cast finish obtained through contact with the mould in the case of concrete hardened in the mould. The face may be smooth or textured.

Dry-cast off-the-form finish

As cast fair-faced finish obtained through contact with the mould in the case of immediate demoulding.

The characteristics of concrete finishes are:

- Texture, from the most elaborated to evenness and, if it is more coarse, unevenness, possibility developing to a maximum unevenness, which is difficult to stipulate;
- Colour which can be expressed in colour scale;
- Grey tone which can be expressed in grey scales, sometimes with some colour incorporated;
- Pattern, a characteristic, in another type and scale than three above, and which can be formed by variations in these characteristics.

In contrast to the consciously selected characteristics there can be additional surface aspects of sorts which are not desired which consequently should be named deviations (i.e. deviations from intentional characteristics or from the quality level for these characteristics). To these belongs blowholes, lumps, groove etc.

As a consequence one should separate between characteristics on one side and deviations on the other side and consider them as different matters, due to the great difference in their nature.

In contrast one should observe that blowholes in certain cases can be intentional, if they are uniformly distributed over a concrete surface, to lend it a visual "softness".

For some products, such as architectural components, the required surface appearance could be chosen on the basis of samples for coordinating the surface character. Before building or at delivery, start reference surfaces are chosen from the sample surface. At the time an order is placed, agreement on the appearance of the face(s) is formalized by an acceptance report for the reference sample(s) proposed by the manufacturer. This report also identifies the conventional mean colour chosen from a reference colour chart to be used to subsequently assess consistency of colour (see Annex C and Annex E).

NOTE 1 Colour scales are not included in this CEN technical report because the paper publication is in black and white. Each country could establish special colour scales.

NOTE 2 The consistency of concrete appearance is governed by the uniformity of the raw materials from which it is made or of the pigments used. The fact that the raw materials are of natural mineral origin implies tolerances on the appearance of the concrete products supplied.

NOTE 3 Because of the time it takes for concrete to cure, the appearance of the reference sample can be assessed only after a certain minimum time, generally one week after treatment, or longer, depending on the cements used (e.g. CEM II A and CEM II B) and in all cases at delivery.

NOTE 4 When the colour consistency of several products is inspected at the same time, account should be taken of any age differences.

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1 Scope

This document provides guidelines for the surface appearance of precast concrete products and the methods for inspecting and assessing the conformity of appearance which, unless they are not appropriate, will be used in conjunction with specific product standards. This document may also be used to describe the appearance of products for which there is no standard.

If there is a specific standard for a precast concrete product, it takes priority over this document.

2 Terms and definitions

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

2.1 Faces

2.1.1

seen face

surface intended to be seen when in use

2.1.2

facing layer

layer of concrete on the seen face of a product of different material and/or properties to the main body or backing layer of a product. Facing layer may be not completely mixed colour concrete (marbling)

NOTE To be distinguished from wipe, i.e. a fine cement mortar or slurry applied to the surface of the product.

2.1.3

arris

part of a product where two faces meet. It can be bevelled, rounded, chamfered, radiussed or splayed

2.1.4

draw

intended angle of the side face from the vertical plane of a product

2.1.5

chamfer

bevelled arris

2.2 Finishes

2.2.1 General

2.2.1.1

unformed surface

surface not in contact with the mould during moulding. This surface may be given complementary treatment while the concrete is still green to give a more uniform finish. The different treatments possible are defined below

NOTE In certain special cases the shape of the precast unit may require application of a moulding surface to the upper face of the unit; this may result in a large number of blowholes which may be attenuated by one of the surface treatments defined below.

2.2.1.2

screeded

finish obtained by drawing a straightedge, for example, across the surface of the concrete

2.2.1.3 floated

finish obtained by using a float, for example, or similar tool

NOTE Cement and sand may be sprinkled on and worked into bleeding concrete or mortar if the quantities are moderate and the work is regular and carried out with an equally proportioned mix of cement and very fine sand. Use of cement alone is prohibited.

2.2.1.4 trowelled

finish obtained by using a steel or other kind of trowel, for example

2.2.1.5 semi-polished

finish obtained when the surface of the concrete is semi-polished with a rag or expanded polystyrene, for example, or brushed with a soft or other kind of brush

2.2.1.6 imprinted

finish obtained by using an indent roller or similar tool to be defined at the time of the order

2.2.2 Worked surfaces

2.2.2.1 Worked in plastic state

2.2.2.1.1 brushed

roughness created by brushing the surface of the fresh mortar with a stiff brush

2.2.2.1.2 water-washed

surface from which the first 2 mm and more of fine mortar is removed by washing

2.2.2.1.3 fine washed

surface from which not more than 2 mm of the first fine mortar is removed by washing

2.2.2.2 Worked in hardened state

2.2.2.2.1 bush hammered

result of scalling the surface of hardened concrete with a bush hammer

2.2.2.2.2 acid-etched

exposed aggregate finish in which the aggregate has been exposed by putting an acid solution on the surface for a time and washing it off with water

2.2.2.2.3 chemically retarded

exposed aggregate finish (to a greater or lesser extent) in which the concrete surface has been treated with a retarder and the hardened product has been washed down with water and/or brushed

2.2.2.2.4 splitted

irregularly chipped or hammered face reveals all the constituents of the concrete, including broken coarse aggregate

NOTE The above techniques require considerable skill in the work procedures, and require extra concrete cover in the case of reinforced products.

2.2.2.2.5

flamed

exposed aggregate finish in which the top few millimetres of the surface have been flaked off by flame action, for example

2.2.2.2.6

finely ground

surface itself is ground back with a mechanical grinder, used wet or dry, to partially expose the fine aggregate (sand)

2.2.2.2.7

grinded

description of a surface which is grinded once without abrading. Brush marks and pores can be visible

2.2.2.2.8

coarsely ground

surface is ground back to some depth with a mechanical grinder, used wet or dry, to reveal the deep texture of the concrete and provide rough surface retaining grinding marks

2.2.2.2.9

polished

coarsely ground surface may be ground several times with increasingly fine grit heads to achieve a uniform finish without visible marks. Depending on the type of aggregate and the final treatment, the finish may be gloss, with or without blowholes

2.2.2.2.10

sawed

raspy surface without any more preparation

2.2.2.2.11

abrasive blasted

hardened concrete surface is blasted with sand or grit. The grading of the grit, its hardness, and the spray pressure used enable variation from brush blasting (light abrasion of the surface skin) to heavy blasting that partially exposes the aggregate

2.2.2.2.12

pressure jetted

hardened concrete surface is sprayed with a high-pressure water jet

NOTE

The water pressure and adjustment of the jet enable the depth of abrasion and therefore the resulting finish to be varied.

2.2.2.2.13

shot blasting

erosion of surface by projection of steel shot

2.2.2.2.14

aging

processing with special hammering techniques will give a rustic and antique look

2.2.2.2.15

bossed

on the split surface, aris are broken to give an effect of cut stones

2.2.2.2.16

point tooling

result of scalling the surface of hardened concrete with a pointed graver

2.2.3 Painted or coated surface

2.2.3.1

coated surface

surface faced at delivery in accordance with stipulations made at the time of the order

2.2.3.2

surface to be painted or coated

surface to be painted or coated after delivery

NOTE 1 Since the requisite finish depends on the type and "build" of the paint to be used, these parameters should be known at the time of the order.

NOTE 2 Any mould release agent on the surface should be compatible with the stipulated paint or coating.

2.3 Surface characteristics

Surface characteristics are defined in Table 1.

Table 1 — Surface characteristics

Characteristics	Description
Blowholes	In mass concrete: voids at the surface of the concrete. For facing concrete: defects consisting of the appearance of bubbles (blisters) or pits (burst bubbles), generally around 5 mm deep and between a few millimetres and a few centimetres in diameter (cf. Annex D).
Large crack	Crack more than 2 mm wide.
Scaling	Thin layer of hardened mortar separating from the concrete surface in fragments called 'flakes'.
Corner spalling	Spalling at the corner of the concrete unit.
Efflorescence	Fine, generally whitish crystalline deposit forming at the concrete surface. NOTE When efflorescence occurs it is not deleterious to the performance of the product in use and is not considered significant.
Spalling	Detachment of fragments from a concrete surface.
Crazing	Network of fine and shallow cracks forming a regular mesh. Appears at the surface of the concrete.
Crack	More or less regular linear opening (discontinuity) in the concrete, between 0,2 mm and 2 mm wide. Any smaller or larger, and it is a micro crack or a large crack.
Surface crack	Crack that does not go through the thickness of the structure. It is widest at the surface and becomes zero at depth.
Laitence	Laitence is a mixture of water and the finer constituents of the concrete.
Swelling	Swollen appearance of the concrete due to an increase in volume.
Micro crack	Very tight, more or less regular, most commonly discontinuous linear crack less than 0,2 mm wide. May extend to form a network.
Honeycombing	Defect with lack of fines or mortar between aggregates.
"aggregate transparency" Marbling effect	Large aggregate appearance through the concrete surface, creating a network of oval marks which may be darker or lighter than the rest of the surface, depending on the case.
Surface wear	Wear of the concrete due to abrasion or erosion.
Colour variations	Differences in concrete colour in the same section of the works.