
**Betonski izdelki – Protihrupne ovire in ograje za cestni promet – Zahteve in
preskusne metode**

Precast concrete products - Road traffic noise reducing devices and barriers -
Requirements and test methods

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June 2004

ICS

English version

Precast concrete products - Road traffic noise reducing devices and barriers - Requirements and test methods

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If this draft becomes a European Standard, 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.

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EUROPÄISCHES KOMITEE FÜR NORMUNG

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The numbering of clauses is strictly related to EN 13369: Common rules for precast concrete products, at least for the first three digits. When a clause of EN 13369 is not relevant or included in a more general reference of this standard, its number is omitted and this may result in a gap on numbering.

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Foreword

This document (prEN 14990:2004) 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 the CEN Enquiry.

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports the essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative annex ZA, which is an integral part of this document.

Annexes A, B and C are normative.

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Introduction

Noise barriers are nowadays the system most frequently adopted to control acoustical pollution from transportation systems: these noise reducing devices should not only fulfil basic acoustic function, but also maintain their structural performance during the required service life when exposed to environmental and atmospheric agents.

As deterioration of products could be induced by several factors (traffic vibration, biological changes, freezing and thawing, chemical agents, etc.), the most important tools to guarantee appropriate durability according to European Standards requirements are design specifications, factory production and process control.

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1 Scope

This European Standard specifies criteria and material-specific requirements of precast concrete noise barriers and acoustic elements to be used in the construction and rehabilitation of new and existing traffic roads.

Furthermore, this European Standard describes test methods and defines quality control, type and scope of factory production control and certification of conformity, which can also be used for other Transport systems. In this case additional requirements could be necessary.

This European Standard does not apply to load bearing components, such as posts or other supporting members, whose principal function is to support noise barriers and acoustic elements. It also does not apply to the acoustic properties of noise barriers and acoustic elements.

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 206-1:2000, *Concrete – Part 1: Specification, performance, production and conformity.*

EN 1354:1996, *Determination of compressive strength of lightweight aggregate concrete with open structure.*

EN 1793-1:1997, *Road traffic noise reducing devices – Test method for determining the acoustic performance – Part 1: Intrinsic characteristics of sound absorption.*

EN 1793-2:1997, *Road traffic noise reducing devices – Test method for determining the acoustic performance – Part 2: Intrinsic characteristics of airborne sound absorption.*

EN 1794-1:2003, *Road traffic noise reducing devices – Non-acoustic performance – Part 1: Mechanical performance and stability requirements.*

EN 1794-2:2003, *Road traffic noise reducing devices – Non-acoustic performance – Part 2: General safety and environmental requirements.*

EN 1992-1-1:YYYY, *Eurocode 2: Design of concrete structures - Part 1-1: General rules and rules for buildings.*

EN 12878:1999, *Pigments for the colouring of building materials based on cement and/or lime – Specifications and methods of test.*

EN 13369: YYYY, *Common rules for precast concrete products.*

prEN 14388:YYYY, *Road traffic noise reducing devices – Specifications.*

3 Terms and definitions

For the purposes of this European Standard, the terms and definitions given in EN 13369:YYYY, clause 3 and the following apply.

3.1

noise barrier

a precast concrete noise barrier is an interchangeable mural (like wall panel) component of a noise reducing device. It can consist of one or multiple layers

3.2

load bearing layer

the load bearing layer is that part of a noise barrier which transmits the dead weight of the noise barrier and the wind and dynamic load to which it is subjected to load bearing components. It provides area-covering support for the non-structural layers

3.3

non structural layer

the non structural layer of a noise-protection element consists of cement-based building materials with aggregates. In multiple layer constructions the load bearing layer is connected to the non structural layer over its entire surface or specific connector and usually possesses sound absorbing properties. The non-structural layer can be manufactured fresh-in-fresh with the load bearing layer or separately as an acoustic element

3.4

acoustic element

an acoustic element is a part of a noise protection device with acoustic characteristics, which is installed subsequently onto available basic constructions (e.g. tunnel walls, through walls, retaining walls)

3.5

fair faced concrete surface

the fair faced concrete surface is the remaining visible section, that the features of the design and the production leaves visible and identify decisive the architectural effect of a component or a building

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4 Requirements

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4.1 **Material requirements** standards.iteh.ai/catalog/standards/sist/e96f6148-ace4-413d-80f5-dd805a80bb61/osist-pren-14990-2004

4.1.2 Constituents materials of concrete

4.1.2.1 Concrete for load-bearing layers

The concrete used for load-bearing layers of noise-protection elements shall conform to EN 206-1:2000.

4.1.2.2 Concrete for non-structural layers

Concrete used for non-structural layers shall be produced from base materials which conform to the requirements laid down in EN 206-1:2000, subclauses 5.1.2 to 5.1.6. If other concrete components are used, see 4.1.5.

4.1.3 Reinforcing steel

Reinforcing steel shall comply with subclause 4.1.3 of EN 13369:YYYY.

4.1.5 Inserts and connectors

Inserts and connectors shall comply with EN 13369:YYYY, subclause 4.1.5.

4.1.6 Pigments

Pigments shall comply with EN 12878:1999.

4.1.7 Other materials

Materials not complying with the specifications in 4.1.2 to 4.1.6 shall be supported by satisfactory data on the properties of concrete made with them. When incorporated into noise barriers or acoustic elements, those products shall be of equivalent quality to products made using only materials covered by the specifications from 4.1.2 to 4.1.6.

4.2 Production requirements

Noise barriers and acoustic elements shall comply with the relevant parts and requirements of EN 1794-1:2003 and EN 1794-2:2003.

The design and production of load bearing layers shall be in conformity with EN 13369:YYYY unless deviating specifications in this standard apply.

If components of noise barriers consist of multiple layers, e.g. if their structure includes sound absorbing layers or facing, a lasting connection between those layers and the load bearing concrete layer shall be provided.

4.2.2 Hardened concrete

4.2.2.2 Compressive strength

4.2.2.2.1 Load bearing concrete layers

The concrete compressive strength of load bearing layers of noise barriers shall be determined in accordance with the provisions in EN 206-1:2000.

4.2.2.2.2 Non structural layers

Concrete used for non-structural layers and facing shall have an adequate compressive strength. The Test according to EN 1354:1996 is to apply. standards.iteh.ai/catalog/standards/sist/e96f6148-ace4-413d-80f5-dd805a80bb61/osist-pren-14990-2004

4.3 Finished product requirements

4.3.1 Geometrical properties

4.3.1.1 Production tolerances

The length and width deviations of noise barriers shall not exceed ± 20 mm. The length, width and height of the elements shall be determined according to Figure J.1 of EN 13369:YYYY.

The thickness shall be within the permissible deviations given in Table 1.

For noise barriers of planar (straight) design, the deviation of the edges from a straight line and from parallelism shall not exceed the values given in Figure 1. This value shall be determined according to Figure J.2 of EN 13369:YYYY.

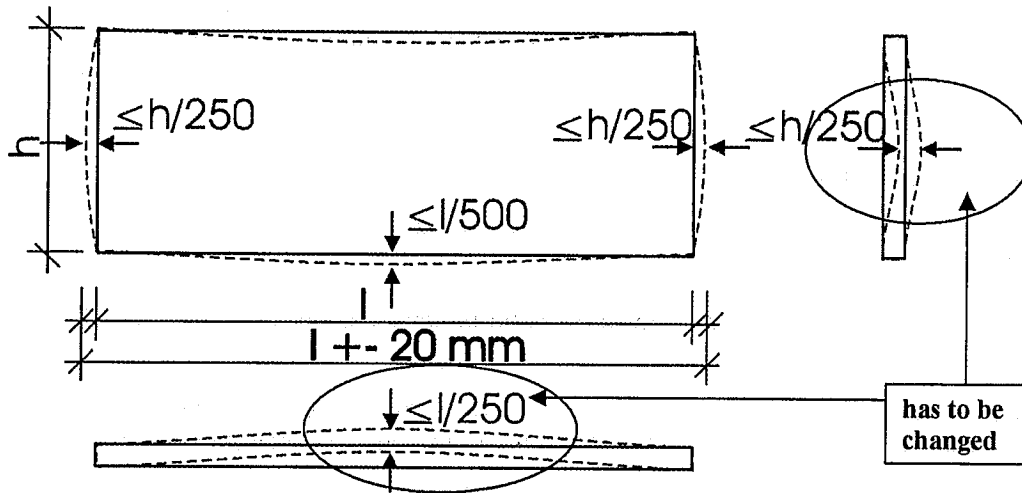


Figure 1 – Permissible deviations of edges from a straight line and from parallelism

For rectangular noise barriers, the deviation of the plane diagonals shall not exceed 1 % of the theoretical diagonal. This value shall be determined according to Figure J.3 of EN 13369:YYYY.

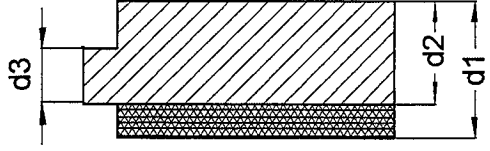
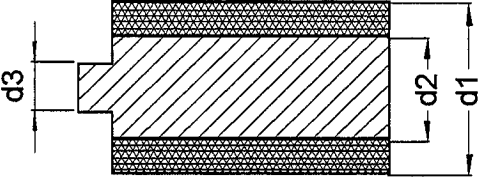
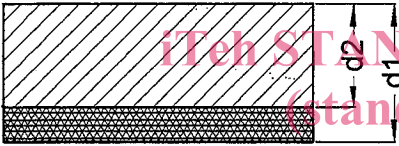
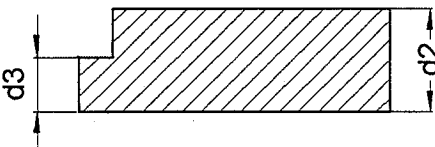
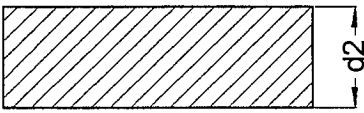
For noise barriers of non-planar design, permissible deviations shall be specified by the manufacturer.

For noise barriers with different shapes, permissible deviations shall be specified by the manufacturer.

For cut-outs in noise barriers, permissible deviations shall be specified by the manufacturer.

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Table 1 – Permissible deviations for thickness of noise barriers

Type of noise barrier	d1 (mm)	d2 (mm)	d3 (mm)	d4 (mm)
<p>A</p> 	+10 -10	+10 -5	+8 -8	
<p>B</p> 	+15 -15	+10 -5	+8 -8	
<p>C</p> 	+10 -10	+10 -5		
<p>D</p> 		+10 -5	+8 -8	
<p>E</p> 		+10 -5		

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