

## საქართველოს სტანდარტი

სსკ: 91.010.30; 91.080.17

ევროკოდი 9 - ალუმინის კონსტრუქციების დაპროექტება- ნაწილი 1-5:  
გარსული კონსტრუქციები

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## Eurocode 9 - Design of aluminium structures - Part 1-5: Shell structures

Eurocode 9 - Calcul des structures en aluminium -  
Partie 1-5 : Coques

Eurocode 9 - Bemessung und Konstruktion von  
Aluminiumtragwerken - Teil 1-5: Schalentragwerke

This European Standard was approved by CEN on 2 January 2023.

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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## European foreword

This document (EN 1999-1-5:2023) has been prepared by Technical Committee CEN/TC250 “Structural Eurocodes”, the secretariat of which is held by BSI. CEN/TC 250 is responsible for all Structural Eurocodes and has been assigned responsibility for structural and geotechnical design matters by CEN.

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of an identical text or by endorsement, at the latest by September 2027, and conflicting national standards shall be withdrawn at the latest by March 2028.

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

This document supersedes EN 1999-1-5:2007.

The main changes compared to the previous edition are listed below:

- Some reorganization of the text and its coherence with EN 1999-1-1 and the other Eurocodes;
- Update of Annex A on buckling formulae for cylinders, cones and spheres;
- New, more accurate formulation for imperfection reduction factors given in Annex A, related to unstiffened and stiffened shells under axial load, circumferential pressure and shear, including the case of axial compression with coexistent internal pressure;
- Better fitting of buckling curves against benchmarked available data, also considering the addition of a new material class in EN 1999, which led to three buckling classes A, B and C;
- Improvement of wording.

The first generation of EN Eurocodes was published between 2002 and 2007. This document forms part of the second generation of the Eurocodes, which have been prepared under Mandate M/515 issued to CEN by the European Commission and the European Free Trade Association.

The Eurocodes have been drafted to be used in conjunction with relevant execution, material, product and test standards, and to identify requirements for execution, materials, products and testing that are relied upon by the Eurocodes.

The Eurocodes recognize the responsibility of each Member State and have safeguarded their right to determine values related to regulatory safety matters at national level through the use of National Annexes.

Any feedback and questions on this document should be directed to the users’ national standards body. A complete listing of these bodies can be found on the CEN website.

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

## 0 Introduction

### 0.1 Introduction to the Eurocodes

The Structural Eurocodes comprise the following standards generally consisting of a number of Parts:

- EN 1990 Eurocode: Basis of structural and geotechnical design
- EN 1991 Eurocode 1: Actions on structures
- EN 1992 Eurocode 2: Design of concrete structures
- EN 1993 Eurocode 3: Design of steel structures
- EN 1994 Eurocode 4: Design of composite steel and concrete structures
- EN 1995 Eurocode 5: Design of timber structures
- EN 1996 Eurocode 6: Design of masonry structures
- EN 1997 Eurocode 7: Geotechnical design
- EN 1998 Eurocode 8: Design of structures for earthquake resistance
- EN 1999 Eurocode 9: Design of aluminium structures
- New parts are under development, e.g. Eurocode for design of structural glass

The Eurocodes are intended for use by designers, clients, manufacturers, constructors, relevant authorities (in exercising their duties in accordance with national or international regulations), educators, software developers, and committees drafting standards for related product, testing and execution standards.

NOTE Some aspects of design are most appropriately specified by relevant authorities or, where not specified, can be agreed on a project-specific basis between relevant parties such as designers and clients. The Eurocodes identify such aspects making explicit reference to relevant authorities and relevant parties.

### 0.2 Introduction to EN 1999 (all parts)

EN 1999 (all parts) applies to the design of buildings and civil engineering and structural works made of aluminium. It complies with the principles and requirements for the safety and serviceability of structures, the basis of their design and verification that are given in EN 1990.

EN 1999 (all parts) is only concerned with requirements for resistance, serviceability, durability and fire resistance of aluminium structures. Other requirements, e.g. concerning thermal or sound insulation, are not considered.

EN 1999 (all parts) does not cover the special requirements of seismic design. Provisions related to such requirements are given in EN 1998, which complements, and is consistent with EN 1999.

Eurocode 9 is subdivided in various parts:

- EN 1999-1-1 Eurocode 9 — Design of Aluminium Structures — Part 1-1: General rules;
- EN 1999-1-2 Eurocode 9 — Design of Aluminium Structures — Part 1-2: Structural fire design;