

L1 The Eurocodes

What are they?

The Eurocodes system

The Eurocodes are a set of European Standards (EN) for the design of buildings and other civil engineering works and construction products.

The Eurocodes cover in a comprehensive manner the basis of design, actions on structures, the principal construction materials, all major fields of structural engineering and a wide range of types of structures and products.

EN 1990	Eurocode: Basis of structural 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

The EN Eurocodes

The verification procedure is based on the limit state concept used in conjunction with partial safety factors. The Eurocodes allow for design based on probabilistic methods as well as for design assisted by testing, and provide guidance for the use of these methods.

European legislation

The Eurocodes serve as reference documents for the following purposes:

- as a means to prove compliance of building and civil engineering works with the Essential Requirements of the Construction Products Directive – CPD (Directive 89/106/EEC);
- as a basis for specifying contracts for public construction works and related engineering services (Directive 2004/18/EC);
- as a framework for drawing up harmonised technical specifications for construction products.

CE Marking



CE marking is mandatory for products covered by a Directive and allows them to freely circulate within the European Economic Area.

CE marking follows the successful approval of a product and symbolises the conformity of the product with the Directive. The use of Eurocodes raises a presumption of conformity with the Essential Requirement 1, and parts of Essential Requirements 2 and 4 of the CPD.

Innovation – The role of EN 1990

EN 1990 establishes for all the structural Eurocodes the Principles and Requirements for safety, serviceability and durability of structures.

EN 1990 also provides the basis for the structural design and verification of buildings and civil engineering works and gives guidelines for related aspects of structural reliability.

The Eurocodes provide common structural design rules for everyday use for the design of structures and products of both a traditional and an innovative nature.

The Eurocodes are written in a style encouraging innovation and form a common basis for R&D in civil engineering.

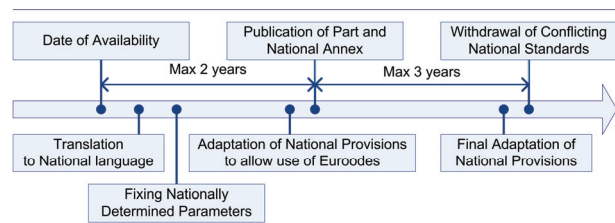
Flexibility – Nationally Determined Parameters

The Eurocodes “recognise the responsibility of regulatory authorities in each Member State and have safeguarded their right to determine values related to safety matters at national level where these continue to vary from State to State”.

National choice is provided by the Eurocodes with sets of recommended values which can be replaced by Nationally Determined Parameters (NDPs). The NDPs account for possible differences in geographical or climatic conditions, or in ways of life, as well as different levels of protection that may prevail at national, regional or local level.

National implementation

Publication of the Eurocodes was completed in 2007. They can be used in parallel with National Standards until mid 2010, the latest date for withdrawing conflicting National Standards.



National implementation of EN Eurocode Part

The National Standard transposing the Eurocode Part will be composed of the Eurocode text followed by the National Annex. The National Annex may contain information on the NDPs to be used in the country concerned, decisions on the application of informative annexes and reference to non-contradictory complementary information.

The future

In order to achieve an adequate application of the Eurocodes, Member States, National Standards Bodies, the construction industry, and all civil engineering professionals must be ready to use them.

Guidance is available and being further developed through continuing professional training, university education, websites, designer handbooks, as well as training and design software. The Commission is promoting actions that will assure consistency between Member States and will facilitate transfer of knowledge.

CEN is responsible for maintenance of the Eurocodes and has developed an appropriate strategy. Maintenance activities will deal with correction of errors, technical amendments, editorial improvements, resolution of questions of interpretation and elimination of inconsistencies and misleading statements.

The Commission urged Member States to "*undertake research to facilitate the integration into the Eurocodes of the latest developments in scientific and technological knowledge [...] thus ensuring an ongoing increased level of protection of buildings and other civil works, specifically as regards the resistance of structures to earthquakes and fire*" (Recommendation 2003/887/EC).

Key indicators

The construction sector¹

- 11.8 million people are directly employed in the sector.
- 26 million workers in the EU-15 depend in one way or another on the sector.
- The sector covers 7% of total employment and 28% of industrial employment in the EU.
- The construction market is estimated to be growing at a rate of 4.2% per year in the new Member States.

Internal Market

- In the first ten years of existence, it created 2.5 million jobs and €877 billion of extra prosperity².
- During the same period, EU exports to third countries have increased from 6.9% of EU GDP to 11.2%².
- An efficiently functioning Internal Market in services could increase trade between 15 to 30%, as well as foreign direct investment between 20 to 35%³.

Standardisation⁴

- Poor-quality regulation costs European business at least €50 billion per year.
- 87% of companies say that the most important priority is to have one set of rules, instead of 27.

Public Procurement⁵

- The EU's public procurement market represents more than 16% of the EU's GDP.
- Public authorities that made purchases using procurement rules paid prices 34% less than authorities who did not use the rules.

¹ <http://ec.europa.eu/enterprise/construction>; ² http://ec.europa.eu/internal_market; ³ Commission Communication COM/2005/0011; ⁴ Commission Communication COM/2003/0238; ⁵ Commission's report on the economic effects of public procurement (2004)

Benefits and opportunities arising from the implementation of the Eurocodes

The Eurocodes are a major and necessary tool for the successful implementation of the Internal Market for construction products and services. Furthermore, they contribute to the safety and protection people in the built environment of the EU, on the basis of the best possible scientific advice.

The benefits and opportunities arising from the implementation and use of the Eurocodes are to:

- lead to more uniform levels of safety in construction in Europe;
- provide common design criteria and methods to fulfil the specified requirements for mechanical resistance, stability and resistance to fire, including aspects of durability and economy;
- provide a common understanding between owners, operators and users, designers, contractors and manufacturers;
- provide a common and transparent basis for fair competition in the construction market;
- facilitate the exchange of construction services;
- facilitate the marketing and use of structural components and kits;
- facilitate the marketing and use of materials and constituent products;
- allow the preparation of common design aids and software;
- increase the competitiveness of the European civil engineering firms, contractors, designers and product manufacturers in their world-wide activities;
- provide a common basis for research and development.

The Single Market and the implementation of the Eurocodes within it benefits citizens and business alike.

Benefits for citizens/consumers

- Wider choice of goods and services, better quality and lower prices.
- More competition in public procurement means better value and higher quality services for the taxpayer.

Benefits for business

- Firms, particularly SMEs, have access to 27 countries and 500 million consumers in Europe.
- Companies are able to bid for contracts to supply goods and services to public authorities in other Member States.
- CE marking reduces border bureaucracy and the cost of multiple testing and certification.
- By aligning the regulatory systems (e.g. public procurement, conformity assessment), trade between the EU and neighbouring countries becomes easier.

For more information

Eurocodes <http://eurocodes.jrc.ec.europa.eu>
DG ENTR <http://ec.europa.eu/enterprise/construction>
CEN www.cen.eu
EOTA www.eota.eu