

L4 The Eurocodes

Opportunity to innovate

The Eurocodes

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

They are the most technically advanced design codes in the world and they promote innovation in structural design.

The Eurocodes are the principal contributor to the protection of the health and safety of citizens in the built environment.

They present significant opportunities for export of construction products and engineering services both in the European and the world markets.

The Eurocodes & EU legislation

The Member States of the EU and EFTA recognise that Eurocodes serve as reference documents for the following purposes:

- as a means to prove compliance of buildings and civil engineering works with the Essential Requirements (ER) of Council Directive 89/106/EEC on the approximation of laws, regulations and administrative provisions of the Member States relating to construction products, particularly ER 1 "Mechanical resistance and stability" and ER 2 "Safety in case of fire".

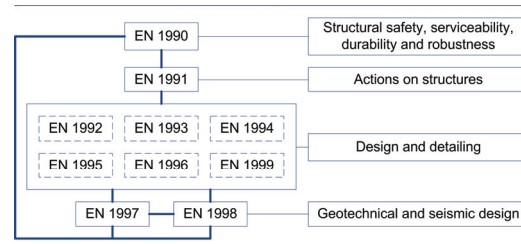
It is noted that the CPD is presently being revised;

- as a basis for specifying public contracts for construction works and related engineering services;
- as a framework for drawing up harmonised technical specifications for construction products.

On 11 December 2003, the European Commission issued a Recommendation (2003/887/EC) "on the implementation and use of Eurocodes for construction works and structural construction products".

The role of EN 1990 – Innovative concepts

EN 1990 establishes for all the Eurocodes the principles and requirements for safety, serviceability and durability of structures.



Links between the Eurocodes

EN 1990 provides the basis for the structural design and verification of buildings and civil engineering works. The verification procedure is based on the limit state concept used in conjunction with partial safety factors.

EN 1990 allows for design based on probabilistic methods as well as for design assisted by testing and provides guidance for the use of these methods to ensure adequate levels of reliability

An appropriate degree of reliability is obtained by design and execution according to the Eurocodes. Annex B of EN 1990 allows the designer to select different levels of reliability and gives guidelines to achieve them.

Design of innovative structures and products with the Eurocodes

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

They are applicable for the structural appraisal of existing construction, in developing the design of repairs and alterations or in assessing changes of use.

The Eurocodes encourage innovation, as clauses are less prescriptive compared to most existing standards. They require and/or allow:

- more understanding of the behaviour of structures;
- greater use of first principles;
- greater use of finite element modelling;
- more advanced analysis methods;
- more efficient and economic design where new understanding/test evidence is available.

The Eurocodes allow flexibility for the designer to choose from a wide range of construction practices and products.

Guidance is given on previously un-codified topics, e.g. performance-based seismic assessment of structures.

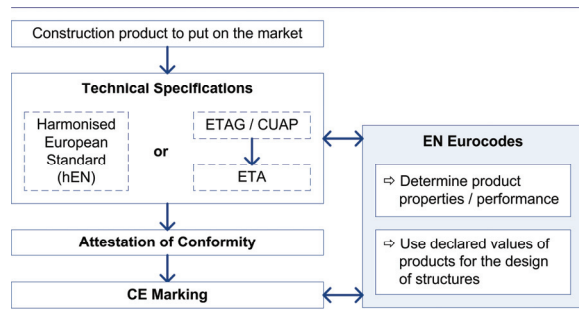
The Construction Products Directive

The Construction Products Directive (CPD) aims to remove artificial barriers to trade through technical harmonisation and is intended for construction products placed on the market.

According to the CPD, construction products which are intended for use in construction works should have such characteristics that the works satisfy the following six Essential Requirements (ER):

- mechanical resistance and stability;
- safety in case of fire;
- hygiene, health and the environment;
- safety in use;
- protection against noise;
- energy economy and heat retention.

The Eurocodes embody in technical terms the first ER and parts of the second and fourth ERs. In the case of construction works designed using the calculation methods described in the Eurocodes, there is a presumption of conformity with these ERs.



CE Marking of products according to the CPD

The CPD is based on four elements:

1. A harmonised system of technical specifications which are harmonised European Standards (hEN) and European Technical Approvals (ETA).
For innovative products that are too early in their life to be covered by a Standard, an ETA may be issued on the basis of an ETA Guideline (ETAG), or through the Common Understanding of Assessment Procedure (CUAP).
2. An agreed system of Attestation of Conformity for each product family which may involve a third party, a Notified Body, to assess conformity.
3. A framework of Notified Bodies.
4. CE Marking of construction products, based on the provisions of the technical specifications.

The Eurocodes and CE Marking



CE Marking is mandatory for any product covered by a harmonised European standard (hEN) or European Technical Approval (ETA) under the framework of the CPD.

The declared values of material and product properties that accompany CE Marking are used as input for the calculations needed to design a structure according to the Eurocodes.

Opportunities in the European and global markets

The Eurocodes improve the functioning of the Single Market for products and engineering services.

Marketing and use of construction products, components and kits is facilitated through a single Attestation of Conformity which is valid in all 27 Member States of the European Union.

A transparent framework for fair competition allows designers to bid for contracts based on common standards and increases the possibilities for export of engineering services.

The Eurocodes encourage innovation and form a common basis for research and development, thus reducing related costs in individual countries.

The Eurocodes give the opportunity to industry and the profession to participate in the maintenance and further development of standards, in the preparation of software and in the supply of guidance on the application and use of the standards.

The Eurocodes improve the competitiveness of the European construction industry in the global market. By constituting a common language between owners, designers and manufacturers they offer opportunities to:

- bid for services and collaborate with local firms in non-EU countries who are using the Eurocodes;
- export products and materials compatible with the design standards;
- demonstrate the safety of design (obtain financing and insurance) based on internationally-recognised Standards.

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