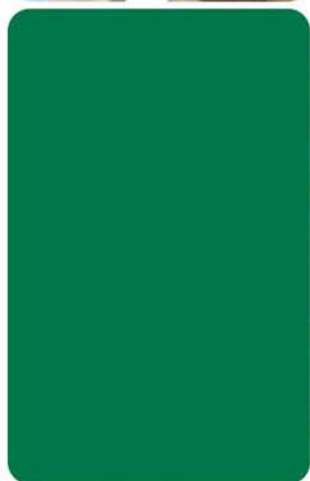




PREBENA[®]



EUROCODE 5

CE according to
DIN EN 14592

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Eurocode Development

The European Commission resolved a programme in 1975 for removing trade restraints in the construction industry. This way, the first Eurocodes for constructive engineering came into life in the 1980s.

In 1989, the European Commission handed the task over to the CEN (European Committee for Standardisation).

First, the Eurocodes were published as draft European standards (ENV), which were implemented experimentally via the so-called National Application Documents (NAD) for technical approval. Since 1997, these draft standards have been transferred into European Standards (EN). The Eurocodes are not all published yet.

When European Union member states establish national standards on the basis of the Eurocodes, they can attach a National Appendix for their country.

In it, nationally determined parameters are possible, so that there are still differences. The process that national standards are transferred into Euro-Standards is not yet completed.

One part of the European Standardisation is the partial safety factors.

The use of Eurocodes has been mandatory since July 2012. However, there are still some transitional periods in some provinces and member states of the EU.

The Eurocodes are unified, Europe-wide design regulations in construction. These European Standards (EN) were prepared - just as the DIN Standards - by scientists and engineers, users and practitioners.

DIFFERENT EUROCODES

Eurocode 0-9 Explanation

Currently, 10 different Eurocodes exist:

- Eurocode 0: Basis of structural design (EN 1990)
- Eurocode 1: Actions on structures (EN 1991)
- Eurocode 2: Design of concrete structures (EN 1992)
- Eurocode 3: Design of steel structures (EN 1993)
- Eurocode 4: Design of composite steel and concrete structures (EN 1994)
- Eurocode 5: Design of timber structures (EN 1995)
- Eurocode 6: Design of masonry structures (EN 1996)
- Eurocode 7: Geotechnical design (EN 1997)
- Eurocode 8: Design of structures for earthquake resistance (EN 1998)
- Eurocode 9: Design of aluminium structures (EN 1999)

The Eurocodes are further subdivided; altogether, there are 58 parts. In addition, there is a national appendix to every Eurocode in every country. In these appendices, the parameters to be determined nationally are primarily defined (for example partial safety factors). Furthermore, additional explanations (for example if there ambiguity due to the translation from English) can be given as well as further application rules be prescribed.

Advantages

- Unified, Europe-wide design criteria
- Harmonisation of nationally different regulations
- Standardised basis for research and development
- Simplified exchange of services and products in the construction industry
- Simplified, Europe-wide tenders of construction work

The Eurocode 5 replaces the old DIN 1052 as design standard.

EUROCODE 5 BREAKDOWN

The standard's designation is DIN EN 1995 and it is divided into 3 parts:

- 1995-1-1 Common rules and rules for buildings
- 1995-1-2 General - Structural fire design
- 1995-2 Bridges

DIN EN 1995 application area

DIN EN 1995, including the corresponding NA (National Appendix), only applies to the design and construction of superstructures and engineering structures made of wood or wooded materials. The constructions can be assembled using adhesives or mechanical means of connection.

Eurocode 5 only covers the requirements for the load-bearing capacity, usability, durability and fire resistance of buildings. Other requirements are not regulated in this standard.

Eurocode 5 prescribes
that fasteners must conform to
DIN EN 14592.

DIN EN 1995-1-1 application area

Part 1-1 of DIN EN 1995 contains the principles for design and construction of wooden structures, particularly for superstructures.

According to NA, this part of the standard also covers wooden constructions in buildings made of other construction materials such as solid buildings, steel constructions

DIN EN 1995-1-1 is subdivided into the following sections:

- | | |
|---------------------------------|--------------------------------------|
| 1. General | 6. Ultimate limit states |
| 2. Basis of design | 7. Serviceability limit states |
| 3. Material | 8. Connection with metal fasteners |
| 4. Durability | 9. Components and assemblies |
| 5. Basis of Structural analysis | 10. Structural detailing and control |

Fixture requirements according to Eurocode 5

Eurocode 5

In chapter 8 of Eurocode 5, the requirements to different means of connection (staples, nails, screws) are laid down.

Here, the characteristic load-bearing capacity and the stiffness of connections are determined on the basis of the applicable test standard respectively. For the Eurocode 5 requirements, the product standard DIN EN 14592 is decisive.

DIN EN 14592

In Eurocode 5, nails and staples are measured according to the product standard DIN EN 14592. This standard specifies the material properties as well as required test methods that are necessary for the compliance of means of connection with the Eurocode 5 requirements.

This distinction can be seen in the form of the CE label. The standard furthermore defines a series of proof and test methods to pursue the preservation of the CE label.

CE conformity according to DIN EN

With the **CE conformity**, the manufacturer **PREBENA** declares according to EU Directive 765/2008, "that the product meets the applicable requirements."

With the **CE conformity**, the company **PREBENA** is obliged to exactly document its processes to ensure securing and observance of the EU guideline.



NAIL DEFINITION

Definition according to DIN EN 14592:

- The nominal diameter of nails must be at least 1.9 mm
- Steel wire with a minimum tensile strength of $f_{u,k} = 600 \text{ N/mm}^2$
- Geometry must conform to DIN EN 14592

Mechanical properties must be determined as follows and provided to the end user.

- Characteristic yield moment
- Characteristic extraction parameters
- Characteristic head pull-tight parameter

These values are determined with the test standards prescribed in product standard DIN EN 14592 and must conform to the requirements of the standard.

PREBENA nails are tested and
conform to DIN EN 14592



Cylindrical shaft



Ring shaft



Screw shaft

STAPLE DEFINITION

Definition according to DIN EN 14592:

- The zinc coating must at least have a thickness of $>121\text{Jm}$
- Cross-sectional area must be circular, shaped like a barrel or rectangular
- Steel wire must have a minimum tensile strength of $f_{u,k} = 800\text{ N/mm}^2$

Mechanical properties must be determined and provided to the end user

- Characteristic yield moment
- Characteristic extraction parameters
- Characteristic head pull-tight parameter

These values are determined with the test standards prescribed in product standard DIN EN 14592 and must conform to the requirements of the standard.

PREBENA staples of the types:

L, Q, Z, WP

In the designs galvanised and corrosion-resistant
are tested and conform to DIN EN 14592.



Service classes (NKL) - (Service Class)



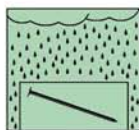
Service classes

The service classes are an important part in planning and designing wooden structures. These requirements are incorporated into the calculations of structural strength and stiffness of the parts and part connections to be constructed. Safe planning can only be ensured if the construction follows these guidelines.

The service classes (NKL) are determined according to Eurocode 5:

Service class 1

It is marked by moisture content in construction materials that correspond to a temperature of 20° C and relative humidity of the ambient air, which may exceed a value of 65% for only a few weeks per year.



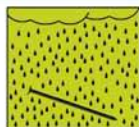
Service class 2

It is marked by moisture content in construction materials that correspond to a temperature of 20° C and relative humidity of the ambient air, which may exceed a value of 85% for only a few weeks per year.



Service class 3

This is used, if the moisture content and the climatic conditions exceed service class 2



Remarks to the service classes:

- With NKL 1, the average moisture content of conifers does not exceed 12%
- With NKL 2, the average moisture content of conifers does not exceed 20%

This must always be taken into account when connections are made using suitable fasteners.

CE Data sheet

Fastening in according to the
Eurocode 5 requirements

DIN EN 14592/A1



www.prebena.com

Staples type: Z – strong galvanized

Diameter: 1,52mm

Length: 32-80mm

Zinc: $\geq 12\mu\text{m}$ (in accordance with EN14592)



Properties of the material used:

- tensile strength in accordance with EN 10218-1 min. 800N/mm²
- zinc layer $\geq 12\mu\text{m}$ in accordance after ISO 2081

Mechanical strength and stiffness:

- Yield moment: $M_{y,k} = 430\text{Nmm}$
- Withdrawal parameter : $f_{ax,k} = 5,76\text{N/mm}^2$
- Head pull-through parameter: $f_{head,k} = 29,33\text{N/mm}^2$

Durability (corrosion-resistance):

galvanized steel

Service Class:

Service Class 1+2 in accordance with EN 1995-1-1



Member in German association
for fasteners and fixings technology



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Mechanical Properties

Here you can see the complete CE labels required by DIN EN 14592. These documents are available for download on our website www.prebena.de.

Our fasteners conform to the properties required in Eurocode 5. The values required for structural design according to EN 1995-1-1 can be seen on the CE data sheet. But it also gets simpler: Just scan the QR code on the respective labels of the fasteners.



1. Service class
2. CE label
3. Material according to EN 14592:2012
4. Year of manufacture
5. Contents
6. Type designation
7. Fixture design
8. EAN code
9. QR code
10. Figure with measurements



1. Service class
2. CE label
3. Material according to EN 14592:2012
4. Year of manufacture
5. Contents
6. Type designation
7. Fixture design
8. EAN code
9. QR code
10. Figure with measurements

PREBENA staples and nails for use under Eurocode 5 are tested according to DIN EN 14592 by the test centre VHT in Darmstadt that is recognised by the building control authorities. Compliance with the normative requirements is confirmed by the test reports of VHT Darmstadt.

The user himself is responsible for using the correct fixture.

Technical changes reserved – we assume no liability for printing errors!

CE label according to Eurocode 5 under www.prebena.de



Sources

- DIN EN 1995-1-1:2010-12
- DIN EN1995-1-1:2004 + AC: 2006 + A1:2008 (D)
- DIN EN 14592:2012-08
- DIN EN 14592:2008 + A1:2012 (D)
- DIN 1052-10
- DIN 20000-6:2012-05 (draft)

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