

# Product category rules

EN 15804 +A2

NPCR 013

Part B for Steel and Aluminium  
Construction Products

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## Revision log

This is an overview of the changes made to this PCR. Typology of changes:

- Editorial (ed): Text or layout edited, with no change in content.
- Technical (te): Existing content has been changed.
- Addendum (ad): New content has been added.

Naming convention: Version x.y, where x is a major revision and y is a minor revision.

Date (2019-04-10)	Type	Description of change
<i>Version 1.0</i>		
Original version, issued 2019-04-10.		
<i>Version 4.0</i>		
Version 4.0 (ed.) EPD-Norway Secretariat References to EN15804+A2 included References to new PCR part A included		



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## Introduction

These product category rules (PCR) are intended for companies preparing an environmental product declaration (EPD) for steel and aluminium construction products. The PCR consists of two parts. This document contains PCR part B specific for steel and aluminium construction products, while Part A contains the requirements that are common for all construction products. When preparing an EPD for steel and aluminium construction products, all requirements outlined in part A and part B must be followed. In PCR part B, the requirements for PCR part A are referred to in each section where they occur. The purpose of this document is to define clear guidelines for performing the underlying life cycle assessment (LCA) to ensure comparability between EPDs.

This PCR was developed from July 2018 to December 2018, by a Norwegian PCR work group (WG) with representatives from the steel industry and with aid from Ostfold Research (Østfoldforskning) and the EPD program operator The Norwegian EPD Foundation. The mandate of CEN/TC 135 on developing an EN standard for "Product category rules complementary to EN 15804 for Steel and Aluminium structural products for use in construction works" was taken into consideration when developing this PCR. The mandate specifies that certain complex aspects concerning allocation of the blast furnace and life cycle module D are to be specified. These issues have therefore not been given priority in the development of this PCR. An editorial revision according to EN 15804:2012 + A2:2019 was performed by The Norwegian EPD Foundation secretariat in June 2021.

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## 1 Scope

This document complements the core rules for the product category of construction products as defined in EN 15804:2012+A2:2019 and NPCR part A, and is intended to be used in conjunction with those standards.

In addition, the intended application of this product category rule (PCR) is to give **guidelines for the development of environmental product declarations (EPD)** for steel and aluminium construction products on the Norwegian market. The core rules valid for all construction products are given in standard EN 15804 and PCR part A, and are expected to be known by those preparing the EPD.

## 2 Normative references

NPCR Part A: Construction products and services. Ver. 2.0. March 2021. Oslo: EPD-Norge.

## 3 Terms and Definitions

As in PCR part A.

In addition, the following product-specific terms and definitions are given:

### 3.1 steel

a material which contains by weight more iron than any other single element, having a carbon content generally less than 2% and containing other elements. A limited number of chromium steels may contain more than 2% of carbon, but 2% is the usual dividing line between steel and cast iron

[EN 10020]

### 3.2 stainless steel

materials with a special resistance against corrosion. Normally they have a chromium content of at least 12% (mass.)

[EN 14002]

## 4 Abbreviations

EPD	Environmental product declaration
	DU Declared unit
FU	Functional unit
PCR	Product category rules
LCA	Life cycle assessment
LCI	Life cycle inventory
LCIA	Life cycle impact assessment
RSL	Reference service life
ESL	Estimated service life

## 5 General Aspects

### 5.1 Objective of PCR Part A and B

As in PCR part A.

## 5.2 Types of EPD in respect to life cycle stages covered

As in PCR part A, including the following additions:

Cradle-to-gate only EPDs are not valid according to this PCR. As a minimum, cradle-to-gate with options that include life cycle modules A1-A3, A4, C1-C4 and D are required.

## 5.3 Comparability of EPD of construction products

As in PCR part A.

## 5.4 Additional information

As in PCR part A.

## 5.5 Ownership, responsibility and liability for the EPD

As in PCR part A.

## 5.6 Communication format

As in PCR part A.

# 6 Product Category Rules for LCA

As in PCR part A.

## 6.1 Product Category

As in PCR part A, including the following additions:

The product group 'steel and aluminium construction products' comprises all kinds of steel and aluminium products. The products that shall follow this PCR, and their related standards, are listed here:

### 6.1.1 Steel and aluminium products

Common steel and aluminium products are:

- EN 10025 Hot rolled products of structural steels - Part 1: General technical delivery conditions
- EN 10080 Steel for the reinforcement of concrete - Weldable reinforcing steel - General
- EN 10210 Hot finished structural hollow sections of non-alloy and fine grain steels - Part 1: Technical delivery conditions
- EN 10219 Cold formed welded structural hollow sections of non-alloy and fine grain steels - Part 1: Technical delivery conditions
- EN 10340 Steel castings for structural uses
- EN 15088 Aluminium and aluminium alloys - Structural products for construction works - Technical conditions for inspection and delivery
- EN 10343 Steels for quenching and tempering for construction purposes - Technical delivery conditions
- EN 10149-1 Hot rolled flat products made of high yield strength steels for cold forming - Part 1: General technical delivery conditions
- EN 10268 Cold rolled steel flat products with high yield strength for cold forming - Technical delivery conditions
- ISO 4997 Cold-reduced carbon steel sheet of structural quality
- EN 10346 Continuously hot-dip coated steel flat products for cold forming - Technical delivery conditions
- EN 10169 Continuously organic coated (coil coated) steel flat products - Technical delivery conditions
- EN 10139 Cold rolled uncoated low carbon steel narrow strip for cold forming - Technical delivery conditions

- EN 10088-5 Stainless steels - Part 5: Technical delivery conditions for bars, rods, wire, sections and bright products of corrosion resisting steels for construction purposes

### 6.1.2 Steel and aluminium structures

Steel and aluminium structures are produced according to the following standards:

- EN 1090-1: Requirements for conformity assessment for structural components
- EN 1090-2: Technical requirements for the execution of steel structures
- EN 1090-3: Technical requirements for the execution of aluminium structures
- EN 1090-4 Execution of steel structures and aluminium structures - Part 4: Technical requirements for cold-formed structural steel elements and cold-formed structures for roof, ceiling, floor and wall applications
- EN 1090-5 Execution of steel structures and aluminium structures - Part 5: Technical requirements for cold-formed structural aluminium elements and cold-formed structures for roof, ceiling, floor and wall applications
- EN 12063 Execution of special geotechnical work - Sheet-pile walls
- EN 12699 Execution of special geotechnical works - Displacement piles
- EN 14199 Execution of special geotechnical works - Micropiles
- EN 13670 Execution of concrete structures (OTE EN 13670 specifies requirements for reinforcing steel bars used as foundation bolts or anchors.)

### 6.1.3 Metal fasteners

Fasteners consist of a wide range of products used in construction, such as bolts, screws and nails. These are produced according to the following standards:

- EN 14399-1 High-strength structural bolting assemblies for preloading - Part 1: General requirements
- EN 15048-1 Non-preloaded structural bolting assemblies - Part 1: General requirements
- Mechanical fasteners for cold-formed steel: Type of fastener with designation of the relevant European Standard or ETA shall be specified.
- EN ISO 3506-series Mechanical properties of corrosion-resistant stainless steel fasteners

### 6.1.4 Pipes and tubes

The PCR covers a wide range of other metal pipes and tubes. These are listed based on the following standards:

- EN 1123 Pipes and fittings of longitudinally welded hot-dip galvanized steel pipes with spigot and socket for waste water systems - Part 1: Requirements, testing, quality control
- EN 1124 Pipes and fittings of longitudinally welded stainless-steel pipes with spigot and socket for waste water systems - Part 1: Requirements, testing, quality control
- EN 10224 Non-alloy steel tubes and fittings for the conveyance of aqueous liquids including water for human consumption - Technical delivery conditions
- EN 10255 Non-Alloy steel tubes suitable for welding and threading - Technical delivery conditions
- EN 10311 Joints for the connection of steel tubes and fittings for the conveyance of water and other aqueous liquids
- EN 10312 Welded stainless-steel tubes for the conveyance of aqueous liquids including water for human consumption - Technical delivery conditions
- EN 10296-2 Welded circular steel tubes for mechanical and general engineering purposes - Technical delivery conditions - Part 2: Stainless steel
- EN 10297-2 Seamless steel tubes for mechanical and general engineering purposes - Technical delivery conditions - Part 2: Stainless steel



### 6.1.5 Other metal construction products

The PCR covers a wide range of other metal construction products. These are listed based on the following standards:

- EN 14195 Metal framing components for gypsum board systems - Definitions, requirements and test methods
- EN 523 Steel strip sheaths for prestressing tendons - Terminology, requirements, quality control
- EN 12285-1 Workshop fabricated steel tanks - Part 1: Horizontal cylindrical single skin and double skin tanks for the underground storage of flammable and nonflammable water polluting liquids other than for heating and cooling of buildings
- EN 12285-2 Workshop fabricated steel tanks - Part 2: Horizontal cylindrical single skin and double skin tanks for the aboveground storage of flammable and non-flammable water polluting liquids
- EN 13084-7 Free-standing chimneys - Part 7: Product specifications of cylindrical steel fabrications for use in single wall steel chimneys and steel liners
- EN 845-2 Specification for ancillary components for masonry - Part 2: Lintels
- EN 1856-1 Chimneys - Requirements for metal chimneys - Part 1: System chimney products
- EN 1856-2 Chimneys - Requirements for metal chimneys - Part 2: Metal flue liners and connecting flue pipes
- EN 1506 Ventilation for buildings - Sheet metal air ducts and fittings with circular cross-section - Dimension
- EN 1507 Ventilation for buildings - Sheet metal air ducts with rectangular section - Requirements for strength and leakage
- EN 40-5 Lighting columns - Part 5: Requirements for steel lighting columns
- EN 40-6 Lighting columns - Part 6: Requirements for aluminium lighting columns
- EN 1317-5 Road restraint systems - Part 5: Product requirements and evaluation of conformity for vehicle restraint systems
- EN 523 Steel strip sheaths for prestressing tendons - Terminology, requirements, quality control
- EN 14889-1 Fibres for concrete - Part 1: Steel fibres - Definitions, specifications and conformity
- EN 13479 Welding consumables. General product standard for filler metals and fluxes for fusion welding of metallic materials

## 6.2 Life cycle stages and their information modules to be declared

### 6.2.1 General

As in PCR part A.

Transport in all life cycle modules shall include the following:

- Direct emissions during transport (exhaust, tyres, etc.)
- Upstream emissions from fuel extraction, processing and distribution
- Life cycle emissions of vehicles (raw materials, manufacturing, maintenance and disposal)
- Life cycle emissions of infrastructure (raw materials, manufacturing, maintenance and disposal)

### 6.2.2 A1-A3, Product stage, information modules

As in PCR part A.

### 6.2.3 A4-A5, Construction process stage, information modules

As in PCR part A, including the following clarification:

The installation phase in A5 shall include the following:

- Waste treatment of packaging
- Energy use during installation
- Wastage of material during installation



- Paint or other surface treatment for products which are intended to be surface treated at the building site

Fasteners (screws) and other additional materials are not included, these are expected to be included at building level assessments.

#### 6.2.4 B1-B5, Use stage, information modules related to the building fabric

As in PCR part A.

#### 6.2.5 B6-B7, Use stage, information modules related to the operation of the building

As in PCR part A.

#### 6.2.6 C1-C4 End-of-life stage, information modules

As in PCR part A.

See also CEN/TC 16970 chapter 6.2.6, Table 2 for additional guidance.

#### 6.2.7 Benefits and loads beyond the system boundary, information module

As in PCR part A.

### 6.3 Calculation rules for the LCA

For declaring steel materials for use in construction, a functional or declared unit can be used. The functional unit should be applied when a specific function and scenario that is typically used is known for the product. If these typical functions and scenarios are many or not known, the declared unit should be used.

The scope and variations of products must be declared according to EPD-Norway guidelines. As of 2019, similar products in the same EPD can only be included if the variations of the results for each LCIA category does not exceed +/- 10 %. The variation shall be stated in the EPD.

#### 6.3.1 Functional unit

As in PCR part A, with the following additions:

The functional unit shall be used for all steel and aluminium construction products with surface treatments and which are typically maintained during use. The products listed in Table 1 shall be declared with the following functional units.

**Table 1: Functional unit for steel and aluminium construction products**

Products with standard	Functional unit	Reference dimension and composition
EN 1090-series	1 kg	Representative for the composition of materials in an actual product.
EN 40-5, EN 40-6,	1 item	Representative for an actual product
EN 10169, EN 10346, EN 10088-4	1 m <sup>2</sup>	Representative for an actual product

The functional unit shall also specify:

- Quantified key properties of the product, when integrated into the construction works, facilitating a functional equivalent comparison with similar products.
- The defined conditions and time period for these performance characteristics.

For products where the service life and maintenance vary greatly on the in-use conditions, both a normal and a worst case scenario should be declared.

For surface treatment with pigments, white and egg white (0502-Y) can be used as a proxy for all colours.

Life cycle modules A1-A5, B1-B7, C1-C4 and D shall be included.

### 6.3.2 Declared unit

As in PCR part A, with the following additions:

The declared unit shall only be used for products where the functional unit is not specified.. The products listed in Table 2 should be declared with the following declared units.

**Table 2: Declared unit for steel and aluminium construction products**

Product standard	Declared unit	Reference dimension and composition
Other	1 kg	Average among produced dimensions, but specific for material composition (including composition of different alloys)
EN 12285-2, EN 13084-7	1 item	Representative for an actual product dimension and composition

If relevant and justified, other units such as item, area, length and volume could be applied for declared unit.

Life cycle modules A1-A4, C1-C4 and D shall be included as a minimum.

If the reference service life of the product is shorter than the reference study period of the construction, independent of the application, then life cycle module B4 for replacement should be included. For project specific EPD, B4 should be included with estimated service life of the actual application.

### 6.3.3 Reference service life (RSL)

As in PCR part A, and:

The reference service life of steel and aluminium construction products depend on the material itself and the building site location. When declaring the functional unit, the number of replacements of steel and/or aluminium materials shall be declared according to a reference study period of 60 years for the building. Products that are not normally replaced during the service life of a building, can declare this as equal to the building service life. For civil engineering products, other reference service life could be applied for the construction.

### 6.3.4 System boundaries

As in PCR part A.

### 6.3.5 Criteria for the exclusion of inputs and outputs (cut-off)

As in PCR part A.

The cut-off criteria in EPD-Norway's general program of instruction (GPI) shall also be followed. As of 2019, the key points of the requirements are :

- that processes and activities that do not contribute more than 1 % of the total environmental impact in some of the environmental impacts categories can be left out.
- production of capital, buildings and equipment that are not included shall also be justified according to the GPI. This justification shall be based on quantitative assessments to the cut-off criteria. Conservative assumption can be used when data is missing and is always better than leaving out activities in the inventory.
- person-related environmental impacts such as travel to and from work are not included.

### 6.3.6 Selection of data

As in PCR part A, including the following additions:

For transport data in life cycle modules A2 and A4, the data representativeness of the transportation type (vehicle size, EURO class, etc.), fuel use and load factor must be shown to be realistic and conservative for the actual use and scenario.

### 6.3.7 Data quality requirements

As in PCR part A.

NOTE: When using databases special attention is needed as many databases do not comply with EN 15804 for all parameters. Typical challenges are completeness, coproduct allocation, and inherent properties such as energy and carbon.

### 6.3.8 Scenarios at the product level

As in PCR part A, including the following additions:

#### 6.3.8.1 A4 Transport to the building site

Transport from the manufacturing site to the construction site is estimated based on information from the manufacturer. The following default values can be used for developing scenarios at the product level:

- For domestic production, the default travel distance from the manufacturing site to the building site (A4) is 300 km.
- For import, the distance is measured from the manufacturing site to a specific storage location, plus a transport distance from the storage location to the building site of 300 km (if not specified). If no specific storage location is given, then the capital city of the country that the product is being imported to may be used as an approximate location.

#### 6.3.8.2 A5 Installation

As in PCR part A.

#### 6.3.8.3 B1-B7 Use phase

As in PCR part A, including the following additions:

Life cycle module B1 shall be declared using the best available data. If test reports are not available, then literature data and expert judgement may be used, however estimates shall be conservative.

#### 6.3.8.4 C1-C4 End-of-life

As in PCR part A. In addition:

Default scenarios for life cycle module C2 transport to waste processing should be based on national statistics.

More than one scenario for waste treatment and disposal should be included if there are several relevant common practices, but the most conservative scenario shall always be included. Default conservative scenarios for C3 waste processing and C4 waste disposal are listed in Table 3.

*Table 3: Default conservative scenarios for life cycle modules C3 and C4*

Product types	C1	C3	C4
Reinforcement steel	Energy used for crushing concrete to separate steel. Sorted as steel waste	Central sorting of mixed steel waste.	Landfilling of residual product parts in sanitary landfill.
Steel structures	Energy used for onsite handling. Sorted as steel waste	Central sorting of mixed steel waste.	Landfilling of residual product parts in sanitary landfill.
Stainless steel	Energy used for onsite handling. Sorted as steel waste	Central sorting of mixed steel waste. 92 % recycled.	Landfilling of residual product parts in sanitary landfill. 8 % landfilled

#### 6.3.8.5 D Benefits beyond life cycle

The calculation procedures for net new scrap must be transparently shown in the report and be a representative and conservative scenario for the whole life cycle. The calculation approach for substitution in module D must be shown to be carried out according to EN 15804 and common practice. The data must be representative for the actual market of the steel and aluminium construction products declared.

For product systems that have net negative new scrap output, this shall also be included, but then as a load based on the same calculation principles as for a net benefit.

#### 6.3.9 Units

As in PCR part A.

### 6.4 Inventory analysis

As in PCR part A.

### 6.5 Impact assessment

As in PCR part A.

## 7 Content of the EPD

### 7.1 Declaration of general information

As in PCR part A, including the following aspects:

The material composition of the product shall be listed with specific weight of the main components as it is installed. This information shall be included in the LCA report. Usage areas and conditions must be specified in the EPD. The harmonised standard for which the product is produced according to, must be specified in the EPD.

The scope of products declared in an EPD must be specified so that the product range can easily be identified by the customer. The ability of scaling LCA results to other dimensions must be specified. If the results cannot be scaled with a conversion factor, which gives results according to the deviation rules outlined by EPD-Norway, then this cannot be included in the EPD.

### 7.2 Declaration of environmental parameters derived from LCA

#### 7.2.1 General

As in PCR part A.

#### 7.2.2 Rules for declaring LCA information per module

As in PCR part A.

#### 7.2.3 Parameters describing environmental impacts

As in PCR part A.

#### 7.2.4 Parameters describing resource use

As in PCR part A.

##### *7.2.4.1 Water use*

As in PCR part A.

##### *7.2.4.2 Electricity used in A3 Manufacturing*

As in PCR part A.

#### 7.2.5 Other environmental information describing waste categories and output flows

As in PCR part A.

#### 7.2.6 Accounting of biogenic carbon during the life cycle

As in PCR part A

#### 7.2.7 Greenhouse gas emissions from land use change

As in PCR part A

### 7.3 Scenarios and additional technical information

#### 7.3.1 General

As in PCR part A.

#### 7.3.2 Construction process stage

### 7.3.2.1 A4, Transport from the production site to the construction site.

As in PCR part A, including the following additions:

Transport from the production gate to the construction site is typically carried out using trucks. The distance, type of vehicle, fuel consumption and degree to which the transport capacity is utilised may have a large impact on transport emissions, thus these factors must be stated. Capacity utilisation is calculated as a percentage (%) mass of the total load capacity of the vehicle. The percentage given shall be the average of the capacity utilisation including the return trip.

Table 4 shows which information shall be provided in the EPD when module A4 is included.

Table 4. Information on the transport to the construction site (A4) required in the EPD.

Type	Capacity utilisation (incl return) %	Type of vehicle, incl emissions class	Distance km	Fuel/energy consumption pr tkm	Fuel energy consumption pr km
Truck					
Railway					
Other transport mode					

### 7.3.2.2 A5, Installation

As in PCR part A, including the following additions:

The EPD shall specify the following information about the installation scenario:

- The consumption of additional materials within the scope of the LCA
- The amount of energy per energy carrier
- Guidance for installation, international standards/regulations or national standards/regulations in which the scenario is based on
- If the EPD deviates from the predefined scenarios, this shall be clearly stated and justified.
- Usage areas and conditions must be specified in the EPD.

### 7.3.3 Use stage

As in PCR part A, including the following additions:

Maintenance, repair and replacement scenarios for steel and aluminium construction materials, that are required to reach the reference study period of the building, shall be described according to manufacturers' guidelines.

### 7.3.4 End of life

As in PCR part A, including the following additions:

Capacity utilization shall be calculated as % of the mass carried of the total load capacity of the vehicle. The number given shall be the average of the capacity utilisation on the trip to the construction site and the capacity utilisation on the return trip.

### 7.3.5 Benefits beyond the system boundary (D)

The EPD shall include a short text description of how the modelling has been performed based on the LCA report. Specific focus shall be given to how net new scrap has been calculated and assumptions for the substitution. The values for gross scrap input and output shall be quantified in a table, and include the net scrap output.

## 7.4 Additional information

As in PCR part A.

### 7.4.1 Additional information on release of dangerous substances to indoor air, soil and water: Indoor air

As in PCR part A, including the following additions:

It is not necessary to do emission tests on the clean steel construction.

### 7.4.2 Additional information on release of dangerous substances to indoor air, soil and water: Indoor air: Soil, ambient air and water

As in PCR part A

### 7.4.3 Additional Norwegian requirements

As in PCR part A.

#### 7.4.3.1 Greenhouse gas emissions from electricity use in A3 Manufacturing

As in PCR part A.

#### 7.4.3.2 *Dangerous substances and content declaration*

As in PCR part A

#### 7.4.3.3 *Emission classification of building materials*

As in PCR part A.

## 7.5 Aggregation of information modules

As in PCR part A.

## 8 Project Report

As in PCR part A.

## 9 Verification and Validity of an EPD

As in PCR part A.

Approved 06.10.2021 , valid until 10.04.2024.

Norwegian EPD Foundation, Technical committee



Christopher Skaar

Leader of the Technical committee



## 10 Bibliography

As in PCR part A, including the following additions:

CEN/TS 16637-3:2016 Construction products. Assessment of release of dangerous substances. Horizontal up-flow percolation test.

CEN/TR 16970:2016. Sustainability of construction works. Guidance for the implementation of EN 15804.

EA NEN 7375. Leaching characteristics of moulded or monolithic building and waste materials. Determination of leaching of inorganic components with the diffusion test. "The tank test".

EN 16516. Construction products: Assessment of release of dangerous substances - Determination of emissions into indoor air.

ISO 21930:2017 Sustainability in buildings and civil engineering works — Core rules for environmental product declarations of construction products and services.

EN 10219: 2006 Cold formed welded structural hollow sections of non-alloy and fine grain steels.

EN 10025: 2004 Hot rolled products of structural steels - Part 2: Technical delivery conditions for non-alloy structural steels

EN 10210: 2006 Hot finished structural hollow sections of non-alloy and fine grain steels

ISO 15686-8: 2008 Buildings and constructed assets – Service life planning – Part 8: Reference service life

EN 1090-2: 2008 Execution of steel structures and aluminium structures: Technical requirements for steel structures.

EN 13670: 2009 Execution of concrete structures.

## Appendix 1: Description of common steel products

[INFORMATIVE]



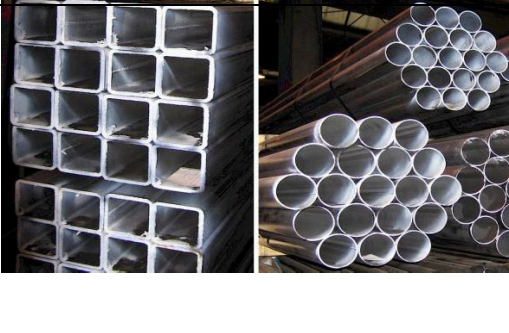





<p>Hot rolled steel plates (thickness 3 – 60 mm) used in building frame structures. Dimensions: t= 3-60. The requirements of the EN 10025 standard are applied. The standard steel grade is <math>\leq</math> S355.</p>	
<p>Hot rolled open H, I, U, L - steel sections and wide flats are hot-rolled sections used in frame structures. Dimensions: IPE 80-600, HEA/B/M 100-600, UNP/UPE 80-400, L 40-200, L 65x50 - 200x150, T 30-140 and wide steels:160-500, t=5-40. The requirements of the EN 10025 standard are applied. The standard steel grade is <math>\leq</math> S355.</p>	
<p>Cold formed hollow steel sections (CFSHS): Circular, square and rectangular sections are used in building frame structures, made of hot-rolled steel strip by cold-rolling and welding. Dimensions: Square HS: 25x2 - 300x12,5. Rectangular HS: 50x25x2 - 400x200x12,5 and Circular HS: 21,3x2 - 711x60 The requirements of the EN 10219 standard are applied. The standard steel grade is <math>\leq</math> S355.</p>	
<p>Hot-finished hollow steel sections (HFSHS): Circular, square and rectangular sections are used in building frame structures, made of hot-rolled steel. Dimensions: Square HS: 40x3 - 400x20. Rectangular HS: 50x30x3,2 - 500x300x20 and Circular HS: 21,3x2 - 711x60. The requirements of the EN 10210 standard are applied. The standard steel grade is <math>\leq</math> S355.</p>	
<p>Steel for the reinforcement of concrete, weldable. Dimensions: D= 6-50. The requirements of the EN 10080 standard are applied. The standard steel grade is <math>\leq</math> B500.</p>	

Figure 1: Example of steel products

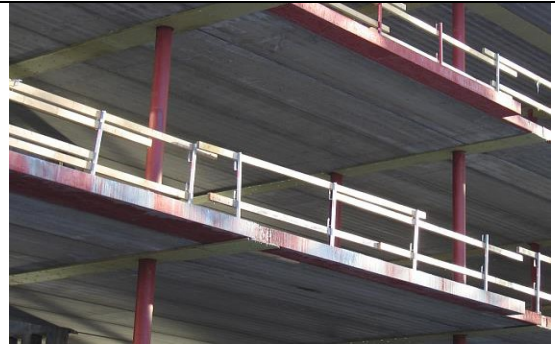
### Steel structural components

Steel components are used to construct structures for buildings. The components can have various shapes and qualities, and the structures have carrying capacities according to predefined standards. The structures are static and a part of the building. They can be built-in structures or open structures.

<p>Welded plated beams; HSQ, ISQ and HSK sections made of welded hot-rolled steel plates used in building frame structures. Plates are made by European manufacturers. Sections are prefabricated and erected on-site by steel contractors.</p> <p>Dimensions: H = 150-600, B1 = 110-600, B2 = 140-700, d = 5-12, t1/t2 = 6-60. The requirements of the EN 10025 and EN 1090-2 standards are applied. The standard steel grade is <math>\leq</math> S355.</p>	
<p>I, H, U, L, T and wide flats are hot-rolled sections used in frame structures. Steel components are prefabricated and erected on-site by steel contractors. Dimensions: IPE 80-600, HEA/B/M 100-600, UNP/UPE 80-400, L 40-200, L 65x50 - 200x150, T 30-140 and wide steels: 160-500, t=5-40. The requirements of the EN 10025 and EN 1090-2 standards are applied. The standard steel grade is <math>\leq</math> S355.</p>	
<p>Cold formed structural hollow sections (CFSHS): Circular, square and rectangular sections are used in building frame structures, made of hot-rolled steel strip by cold-rolling and welding. Steel components are prefabricated and erected on-site by steel contractors. Dimensions: Square HS: 25x2 - 300x12,5. Rectangular HS: 50x25x2 - 400x200x12,5 and Circular HS: 21,3x2 - 711x60. The requirements of the EN 10219 and EN 1090-2 standards are applied. The standard steel grade is <math>\leq</math> S355.</p>	



Hot finished structural hollow sections (HFSHS): Circular, square and rectangular sections are used in building frame structures. Steel components are prefabricated and erected on-site by steel contractors. Dimensions: Square HS: 40x3 - 400x20. Rectangular HS: 50x30x3,2 - 500x300x20 and Circular HS: 21,3x2 - 711x60. The requirements of the EN 10210 and EN 1090-2 standards are applied. The standard steel grade is  $\leq$  S355.



Reinforcement steel for concrete, weldable,. Straight ribbed bars, cut and bend, mesh, and combinations of these (special welded products) are prefabricated and erected on-site by fabricators & prefab contractors. Dimensions: D= 6-50. The requirements of the EN 10080 and EN 13670 standards are applied. The standard steel grade is  $\leq$  B500.



Figure 2: Example of steel components

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