SLOVENSKI STANDARD
oSIST prEN 15512:2019

01-februar-2019

Stabilni jekleni sistemi za skladiščenje - Sistemi za nastavljive regale za palete - Načela dimenzioniranja

Steel static storage systems - Adjustable pallet racking systems - Principles for structural design

Ortsfeste Regalsysteme aus Stahl - Verstellbare Palettenregale - Grundlagen der statischen Bemessung

Systèmes de stockage en acier - Systèmes de rayonnages à palettes réglables - Principes applicables au calcul des structures

Ta slovenski standard je istoveten z: prEN 15512

ICS:

53.080	Skladiščna oprema	Storage equipment

oSIST prEN 15512:2019 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

DRAFT
prEN 15512

November 2018

ICS

Will supersede EN 15512:2009

English Version

Steel static storage systems - Adjustable pallet racking systems - Principles for structural design

Systèmes de stockage en acier - Systèmes de rayonnages à palettes réglables - Principes applicables au calcul des structures

Ortsfeste Regalsysteme aus Stahl - Verstellbare Palettenregale - Grundlagen der statischen Bemessung

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 344.

If this draft becomes a European Standard, 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.

This draft European Standard was established by CEN 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.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

Warning : This document is not a European Standard. It is distributed for review and comments. It is subject to change without notice and shall not be referred to as a European Standard.

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Contents

European foreword

This document (prEN 15512:2018) has been prepared by Technical Committee CEN/TC 344 "Steel static storage systems", the secretariat of which is held by UNI.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 15512:2009.

0 Introduction

0.1 Racking

Racking systems are load bearing structures for the storage of goods in warehouses. The goods to be stored are generally on pallets or in box-containers.

Racking is constructed from steel components including upright frames beams. Special beam to column (upright) connections and bracing systems are utilized, in order to achieve a three dimensional steel 'sway' or 'braced' structure with "aisles" to enable order pickers, industrial trucks or stacker cranes to reach the storage positions. Although components are standardized, they are only standard to each manufacturer. These components differ from traditional column and beam structures in the following regard:

1) continuous perforated uprights;

2) hook-in connections;

3) structural components for racking generally consist of cold-formed thin gauge members.

0.2 Requirement for EN Standards for racking in addition to the Eurocodes

Because of the differences in shape of structural components, detailing and connection types additional technical information to the Eurocodes are required, in order to have reliable state of the art guidance for the practicing designer involved in designing racking.

The scope of CEN/TC 344 is to establish European Standards providing guidance for the specification, design, methods of installation, accuracy of build and guidance for the user on the safe use of steel static storage systems.

This, together with the need for common design rules was the reason that FEM Racking and Shelving has taken the initiative for CEN/TC 344. CEN/TC 344 is in the course of preparation of a number of European Standards for specific types of racking and shelving.

0.3 Liaison

CEN/TC 344 "Steel Storage Systems" liaise with CEN/TC 250 "Structural Eurocodes", CEN/TC 135 "Execution of steel structures and aluminium structures" and CEN/TC 149 "Power-operated warehouse equipment".

0.4 Racking and Work Equipment regulations

Although racking is a load bearing structure, national regulatory requirements may require that racking be considered as 'work equipment' and therefore may be subject to the European Directive 89/391/EEC. This document is not a standalone document and is intended to be used in conjunction with EN 15620, EN 15629 and EN 15635.

0.5 Additional information specific to EN 15512

EN 15512 is intended to be used with EN 1990, Basis of Structural Design, EN 1991, Actions on structures, and the EN 1993 series for the Design of steel structures.

EN 15512 is intended for use by:

— designers and structural engineers;

— relevant authorities.

Numerical values for partial factors and other reliability parameters are basic values that provide an acceptable level of reliability assuming an appropriate level of workmanship and quality management.

1 General

1.1 Scope

This document specifies the structural design requirements applicable to all types of adjustable beam pallet rack systems fabricated from steel members intended for the storage of unit loads and subject to predominantly static loads. Both un-braced and braced systems are included.

This document gives guidelines for the design of clad rack buildings where requirements are not covered in the EN 1993 series. The requirements of this European Standard also apply to ancillary structures, where rack components are employed as the main structural members.

This document does not cover other generic types of storage structures. Specifically, this European Standard does not apply to mobile storage systems, drive-in, drive-through, pallet live storage, push back, shuttle systems, systems where two or more cranes operates one above another in the same aisle and cantilever racks or static steel shelving systems.

For the specific design of adjustable pallet racking for use in seismic areas, this standard should be used in combination with EN 16681.

1.2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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 1990, *Eurocode - Basis of structural design*

EN 1991-1-1:2002, *Eurocode 1: Actions on structures - Part 1-1: General actions - Densities, self-weight, imposed loads for buildings*

EN 1993-1-1:2005, *Eurocode 3: Design of steel structures - Part 1-1: General rules and rules for buildings*

EN 1993-1-3:2006, *Eurocode 3 - Design of steel structures - Part 1-3: General rules - Supplementary rules for cold-formed members and sheeting*

EN 1993-1-8:2005, *Eurocode 3: Design of steel structures - Part 1-8: Design of joints*

EN 10143, *Continuously hot-dip coated steel sheet and strip - Tolerances on dimensions and shape*

EN 15620, *Steel static storage systems - Adjustable pallet racking - Tolerances, deformations and clearances*

EN 15629, *Steel static storage systems - Specification of storage equipment*

EN 15635, *Steel static storage systems - Application and maintenance of storage equipment*

EN 16681, *Steel static storage systems - Adjustable pallet racking systems - Principles for seismic design*

EN ISO 6892-1, *Metallic materials - Tensile testing - Part 1: Method of test at room temperature (ISO 6892-1)*

EN ISO 7438, *Metallic materials - Bend test (ISO 7438)*

ETAG No 001, *Guideline for European Technical Approval of Metal Anchors for Use in Concrete*

1.3 Assumptions - Tolerances with regard to design and assembly

NOTE In addition to the assumptions of EN 1990 the following assumptions apply.

1.3.1 General

All tolerances are defined in the 'as-built' situation prior to operation of the storage system. The deformation under load shall be taken as measured after application of the first imposed load.

1.3.2 Verticality

The maximum out-of-plumb of any upright in any direction should not exceed the values stated in EN 15620 in the unloaded condition immediately after installation.

If the designer specifies an initial out-of-plumb imperfection different from EN 15620 the installation process shall be controlled in order to ensure that the design assumptions are achieved in practice.

NOTE The maximum out-of-plumb is a frame imperfection which influences the design.

1.4 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp

1.4.1
accidental action
action, usually of short duration but of significant magnitude, that is unlikely to occur on a given structure during the design working life

1.4.2
basic material
flat steel sheets or coiled strip, possibly cold-reduced from which the rack components are pressed or rolled

1.4.3
batch
quantity of material, all to the same specification, produced by one supplier at one time

1.4.4
beam
horizontal member linking adjacent frames and lying in the horizontal direction parallel to the operating aisle