SLOVENSKI STANDARD
SIST EN 13782:2015

01-julij-2015

Nadomešča:
SIST EN 13782:2006

Začasne konstrukcije - Šotori - Varnost

Temporary structure - Tents - Safety

Fliegende Bauten - Zelte - Sicherheit

Structure temporaire - Tentes - Sécurité

Ta slovenski standard je istoveten z: EN 13782:2015

ICS:

91.040.99	Druge stavbe	Other buildings

SIST EN 13782:2015 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 13782

April 2015

ICS 91.040.99

Supersedes EN 13782:2005

English Version

Temporary structure - Tents - Safety

Structure temporaire - Tentes - Sécurité

Fliegende Bauten - Zelte - Sicherheit

This European Standard was approved by CEN on 5 March 2015.

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. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists 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, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents

Page

Foreword

This document (EN 13782:2015) has been prepared by Technical Committee CEN/TC 152 “Fairground and amusement park machinery and structures - Safety”, the secretariat of which is held by UNI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by October 2015, and conflicting national standards shall be withdrawn at the latest by October 2015.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 13782:2005.

The main changes in comparison to EN 13782:2005 are:

a) chapters have been restructured and condensed in form and content;

b) technical additions in reference to the Eurocodes;

c) adjustments of the notations used in the Eurocodes;

d) editorial corrections and changes.

According to the CEN/CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: 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, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

The object of this European Standard is to provide safety requirements for tents. The safety requirements are aimed to safe-guard persons and objects against damage caused by design, manufacturing and operation of these structures.

These guidelines have been drawn up according to past experience and risk analysis.

Existing national rules concerning health and safety of workers remain untouched.

1 Scope

This European Standard specifies safety requirements which need to be observed at design, calculation, manufacture, installation, maintenance, of mobile, temporary installed tents with more than 50 m^2 ground area.

This European Standard applies also to multiple small tents which are normally not covered by this standard and will be installed close together and exceed 50 m^2 in sum.

NOTE Information is given in Annex C on Examination and Approval.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 818 (all parts), *Short link chain for lifting purposes — Safety*

EN 1090 (all parts), *Execution of steel structures and aluminium structures*

EN 1990, *Eurocode - Basis of structural design*

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

EN 1991-1-3, *Eurocode 1 - Actions on structures - Part 1-3: General actions - Snow loads*

EN 1991-1-4: *Eurocode 1: Actions on structures - Part 1-4: General actions - Wind actions*

EN 1997-1, *Eurocode 7: Geotechnical design - Part 1: General rules*

EN 10204:2004, *Metallic products - Types of inspection documents*

EN 12385-1, *Steel wire ropes — Safety — Part 1: General requirements*

EN 12385-2, *Steel wire ropes — Safety — Part 2: Definitions, designation and classification*

EN 12385-3, *Steel wire ropes — Safety — Part 3: Information for use and maintenance*

EN 12385-4, *Steel wire ropes — Safety — Part 4: Stranded ropes for general lifting applications*

EN 15619, *Rubber or plastic coated fabrics - Safety of temporary structures (tents) - Specification for coated fabrics intended for tents and related structures*

ISO 2602, *Statistical interpretation of test results — Estimation of the mean — Confidence interval*

3 Terms and definitions

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

3.1
tent
mobile, temporary installed structure enclosed with covers (textiles, foils) or partly with rigid elements

Note 1 to entry: It can be built as an enclosed or open building i.e. marquee, tent-hall, booth.

3.1.1
tent with primary load-bearing structure
load bearing structure with enclosing elements

EXAMPLE Structures with primary load bearing structure can be roofs, frameworks, post-and-beam system.

3.1.2
membrane tent
tent with a load bearing pre-stressed textile structure with double curved shape, supported by masts and/or cables

3.1.3
pole tent
tent with centre poles, where guying is used to stabilize the fabric covering

3.2
initial approval
design and calculation review, verification, examinations and tests necessary for tent operation

3.3
modification
any alteration of a tent which results in a departure from the original design specification

3.4
repair
restorations of worn, damaged or decayed parts back to the original design specification

3.5
maintenance
replacement of components which are designed to be replaced at specified intervals

4 General requirements for design, analysis and examination

4.1 Design documents

The design documents shall include information for the verification of the stability, resistance and operating safety, especially a description of the construction and operation, the stability verification and design drawings as well as relevant documents concerning the burning behaviour.

The documents shall include all the possible configurations of the tent.

4.2 Description of construction and operation

The tent in particular its design and utilization and its static system shall be explained in this description.

The description shall include details of the particular features of the tents and of any alternative modes of installation which may exist, also details of the main dimensions, limitations, design particulars and materials.

4.3 Construction drawings

These shall exist for all sub-assemblies and individual components, the fracture or failure of which might endanger, the stability or operating safety of the tent.

The construction drawings shall feature all the dimensions and cross section values required for testing and approval, also details of materials, structural components, fasteners and connectors.

The construction plans shall comprise the following:

— General drawings in plan view, elevation and sections, to one of the following scales, i.e. 1:100, 1:50 or 1:20. If clearness and readability does not suffice other scales shall be used;

— Detail drawings relating to all the structural subassemblies not clearly discernible on the general drawings, also detail plans of connections and of individual items of structural nature that are likely to affect the safety of the tent and of its operation, drawn to a larger scale.

5 Selection of materials

5.1 General

Only materials in respect of which design data are featured in European Standards shall be used for structural components.

Other materials can only be used on condition that proof of their serviceability has been established. The designer shall give special consideration to structural joints which are to be welded and the weldability of the selected metals in accordance with European Standards.

5.2 Selection of covering materials

For rubber and plastic coated fabrics EN 15619 applies. The supplier certification shall be provided.

For other fabric materials and cladding elements of:

— cotton fabrics;

— synthetic fabrics;

— solid covering and sheeting such as sectional metal sheets, wood or plastic panels and multi components elements,

the following requirements shall be regarded:

— fabric materials designated for structural use shall conform to EN standards or, in absence, to agreement by the parties involved;

— it shall be ensured that the material and the connections specified provides sufficient weathertightness, tensile strength to ensure safe and durable performance of the textile cover. The partial safety factors for structural use of fabrics shall be according to 8.6;

— standards for textile, membrane and inflatable structures.

5.3 Joining of covering materials

Joints by sewing, welding and adhesives and zips shall conform to the relevant EN standards or shall be tested for their ultimate tear and shear properties. The ageing and environmental influences shall be taken into account by the application of additional partial safety factors.

Zips shall be tested for their strength to withstand the calculated loads of the structure. Effects of wearing out and influence of UV light on plastic shall be considered.

If suitable structural strength cannot be verified they can only be used in non-safety critical applications.

6 Principles of numerical analysis

6.1 General

If subsequently not determined differently, the verification shall follow the relevant part of the Eurocode and shall comprise:

— limit states analysis (according to theory of 1st or 2nd order);

— stability limit states analysis, i.e. bar buckling plate and shell buckling;

— if required, verification of deformation limit states;

— verification of safety against overturning, sliding and lifting off.

6.2 Verification

The verification shall include the following details, amongst others:

— design loads, taking into account the possible operating conditions or installations alternatives. Special loads imposed during erection should be recognized;

— information concerning material and components;

— main dimensions and cross-section values of all load bearing structural components;

— determination of the most unfavourable stresses and details relating to the strength of the load bearing structural components and of the fasteners;

— if calculations are insufficient to evaluate limit states of assemblies the analysis may be substituted by testing at an independent testing body. There, the testing body shall commit the appropriate number of tests, samples, the testing procedure, the reporting etc., according to the relevant EN standards or in absence of the relevant EN standards by agreement with the parties involved;

— details of deformations (flexure, torsion), in as much as such details affect the serviceability or operating safety of the tent;

— details of those components which require special examination and inspection.

7 Design actions

7.1 General

All the applicable actions shall be taken into account according to EN 1991-1-1, EN 1991-1-3 and EN 1991-1-4.

Adaptations due to the special utilization of tents are stated in the following chapters.

7.2 Permanent actions

For tents a very precise assumption of the permanent actions is possible. As far as variation can occur the values $G_{k,sup}$ and $G_{k,inf}$ shall be taken into account for assessing the applicable structural response. Elsewhere a single characteristic value G_k is sufficient:

— G_k characteristic value of permanent action;

— $G_{k,sup}$ upper characteristic value of permanent action;

— $G_{k,inf}$ lower characteristic value of permanent action.

Included in the above category are the actual dead loads of the load bearing structure, of the accessories and of the technical equipment required for operation also the claddings, decoration and the like. The influence of dry or wet material conditions shall be recognized ($G_{k,sup}$, $G_{k,inf}$).

7.3 Equivalent load

The stability shall be checked with a vertical uniformly distributed equivalent load of q_{el} = 0,1 kN/m^2 on the roof. This load shall not be combined with other load cases, except self-weight.

7.4 Variable actions

7.4.1 Live loads

7.4.1.1 Vertical loads for areas with universal, public access

The following vertical imposed loads shall be applied for:

— Floors, stairways, landings, ramps, entrances, exits and the like in facilities (tents, booths):

q_k = 3,50 kN/m^2

— Raised floors and platforms or if particularly dense crowds are anticipated for the above mentioned category:

q_k = 5,00 kN/m^2

— Stairs, alternatively, an area load in accordance with clauses above, whatever is more unfavourable:

Q_k = 1,00 kN per step

— Seat boards of rows of seats per seat run and for floors between fixed rows of seats, unless higher loads results from the application of area loads (q_k = 3,5 kN/m^2):

q_k = 1,50 kN/m