



# SLOVENSKI STANDARD

## oSIST prEN 17736:2021

01-november-2021

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### Zabavna tehnologija - Specifikacije za projektiranje in izdelavo aluminijastih odrov in okvirjev

Entertainment technology - Specifications for design and manufacture of aluminium stage decks and frames

Veranstaltungstechnik - Anforderungen an die Bemessung und Herstellung von Podesten und Zargen aus Aluminium

Technologies du spectacle - Spécifications pour la conception et la fabrication de praticables de scène en aluminium

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#### **ICS:**

91.080.17	Aluminijaste konstrukcije	Aluminium structures
97.200.10	Gledališka, odrska in studijska oprema ter delovne postaje	Theatre, stage and studio equipment

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**en**

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**DRAFT**  
**prEN 17736**

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English Version

**Entertainment technology - Specifications for design and  
manufacture of aluminium stage decks and frames**

Veranstaltungstechnik - Anforderungen an die  
Bemessung und Herstellung von Podesten und Zargen  
aus Aluminium

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 433.

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.

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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.

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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

Page

European foreword.....	4
1 Scope.....	5
2 Normative references.....	5
3 Terms and definitions .....	5
4 List of significant hazards .....	6
5 Engineering .....	8
5.1 General.....	8
5.2 Design.....	8
5.3 Analysis.....	8
5.3.1 General.....	8
5.3.2 Load assumptions .....	8
5.4 Engineering documentation.....	9
6 Manufacture .....	9
6.1 General.....	9
6.2 Materials.....	9
6.2.1 General.....	9
6.2.2 Fire behaviour.....	9
6.2.3 Surface condition .....	9
6.3 Welding.....	10
6.4 Inspection .....	10
6.5 Identification .....	10
6.6 Manufacturing documentation.....	10
7 Additional design requirements for stairs, ramps and guardrails .....	10
7.1 Stairs .....	10
7.2 Ramps.....	11
7.3 Guardrails .....	11
7.3.1 General.....	11
7.3.2 Guardrails for stages.....	11
7.3.3 Guardrails for areas with public access .....	12
7.4 Alignment of stage decks.....	12
8 Ancillary items .....	12
9 Test requirements and procedures.....	12
9.1 General.....	12
9.2 Preperation of the test .....	13
9.3 Vertical test loads.....	13
9.3.1 Uniformly distributed load.....	13
9.3.2 Point load .....	13
9.4 Horizontal test load.....	13
9.5 Verification of test results.....	13
9.6 Documentation of test results .....	13
10 User documentation.....	14
Annex A (informative) Technical data sheet example .....	15

<b>Annex B (informative) Example of test setups for testing aluminium stage decks and frames .....</b>	<b>17</b>
<b>B.1 Application of test loads.....</b>	<b>17</b>
<b>Annex C (informative) Test report examples .....</b>	<b>19</b>
<b>C.1 Example of test report for stage decks or frames .....</b>	<b>19</b>
<b>C.2 Example of test report for guardrails.....</b>	<b>20</b>
<b>Annex D (informative) Inspection report example .....</b>	<b>22</b>
<b>Bibliography .....</b>	<b>23</b>

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[oSIST prEN 17736:2021](https://standards.iteh.ai/catalog/standards/sist/cb15e5eb-8dd2-4c56-9d17-49d1593e76e4/osist-pren-17736-2021)

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prEN 17736:2021 (E)

## European foreword

This document (prEN 17736:2021) has been prepared by Technical Committee CEN/TC 433 “Entertainment Technology - Machinery, equipment and installations”, the secretariat of which is held by DIN.

This document is currently submitted to the CEN Enquiry.

This is a type C standard as specified in EN ISO 12100.

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## 1 Scope

This document specifies the safety requirements for planning, selection, production, intended use as well as testing of aluminium stage decks and frames that are capable of being used as aluminium stage decks, inclinations, steps and stairs; including railings for performance areas (stages) and stands.

This document deals with all of the significant hazards, hazardous situations or hazardous events relevant to aluminium stage decks and frames when they are used as intended and under conditions of misuse reasonably foreseeable by the manufacturer.

If these products become components of a built environment, then structural requirements are expected to be taken into consideration.

This document does not apply to scaffolding used as substructures in stage and studio environments in accordance with the standard series EN 12810 and EN 12811 and not for fairground rides in accordance with EN 13814-1.

## 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 17115, *Entertainment technology - Specifications for design and manufacture of aluminium and steel trusses*

EN 17206, *Entertainment technology - Machinery for stages and other production areas - Safety requirements and inspections*

EN 1993 series, *Eurocode 3 - Design of steel structures*

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EN 1995 series, *Eurocode 5: Design of timber structures*

EN 1999 series, *Eurocode 9 - Design of aluminium structures*

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

EN 82079-1, *Preparation of instructions for use - Structuring, content and presentation - Part 1: General principles and detailed requirements*

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 17115 and EN 17206 and the following apply.

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

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

**prEN 17736:2021 (E)****3.1****stage deck**

frame construction predominantly made from aluminium profiles with a load bearing infill

**3.2****frame**

closed frame construction made of aluminium profiles; depending on model with mounting for legs and/or substructure (without load bearing infill)

**3.3****substructure**

structure, independently placed on the market, intended to support decks or frames

**EXAMPLE**

scaffolding, lattice beams, truss

**3.4****plug leg**

detachable straight profile generally mounted in the corners of a deck or frame and perpendicular to the said deck or frame

**3.5****foldable leg**

generally non-detachable straight profile with a hinging action mounted in the corners of a deck or frame

**3.6****scissor leg**

generally non-detachable profiles with a scissor-like action mounted on the bottom side of a deck or frame

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**3.7****guardrail**

physical barrier to protect persons against falling off raised areas

**3.8****load bearing infill**

load bearing structure, for example timber, metal, polymer, attached to the frame

**3.9****toeboard**

board placed around the outer edges of stage decks to prevent objects from falling off the deck when required

**4 List of significant hazards**

Table 1 contains some examples of typical hazards associated with the application of stage decks and frames.



Table 1 — List of significant hazards

	Hazards	relevant clause(s) in this document
<b>1</b>	<b>Mechanical hazards due to:</b>	
1.1	Inadequate mechanical strength	5
1.2	Instability	5
1.3	Gravity and stability	5
1.4	Height from the ground	7.3
1.5	Slippery surface	6.2.3, 7.1, 7.2
1.6	Surface geometry	5, 6
1.7	Potential energy	5, 8
1.8	Sharp edges	6.2.3
1.9	trip hazard	6.2.3
1.10	Transport	5, 8, 10
<b>2</b>	<b>Electrical hazards</b>	
2.1	Contact of persons with parts which have become live under faulty conditions	8, 10
<b>3</b>	<b>Thermal hazards</b>	
3.1	Objects or materials with a high or low temperature	5, 10
<b>4</b>	<b>Noise hazards</b>	
4.1	Mechanical noise	10
<b>5</b>	<b>Vibration hazards</b>	
5.1	loosening of components due to dynamic actions	5, 10
<b>6</b>	<b>Ergonomic hazards</b>	
6.1	Manual handling	5, 10
6.2	Inadequate working light level	10
6.3	Constricted room during assembly	8, 10
<b>7</b>	<b>Hazards associated with the environment in which the product is used</b>	
7.1	Weather conditions (temperature, wind, rain, ice, lightning etc.)	6.2.3, 10
7.2	Humidity	6.2, 10
7.3	Corrosion	6.2, 10
7.4	Seismic activity	10

## 5 Engineering

### 5.1 General

Stage decks, frames and their accessories shall be engineered in accordance with this document.

### 5.2 Design

The design of stage decks, frames and their accessories shall be in accordance with the relevant parts of the European Standards EN 1990, EN 1991 series, EN 1993 series, EN 1995 series and EN 1999 series and the related national application documents as well as EN 1090-2 and EN 1090-3.

Physical testing may be used to support calculation in accordance with the relevant standards. Physical testing shall not be used to replace structural calculation.

### 5.3 Analysis

#### 5.3.1 General

Analysis shall include but not be limited to the following:

- a) influence of height and type of supports (e.g. legs, scissors etc.);
- b) supporting substructure;
- c) connection to supports and supporting substructure;
- d) interaction between stage decks and frames with supporting substructure;
- e) influence of adjacent stage decks and frames;
- f) allowable deflection;
- g) welding process.

#### 5.3.2 Load assumptions

##### 5.3.2.1 General

Analysis shall prove the following minimum load assumptions.

##### 5.3.2.2 Uniformly distributed load

A minimum uniformly distributed vertical load of 5 kN/m<sup>2</sup> shall be assumed.

##### 5.3.2.3 Point load

A minimum single vertical point load of 1,5 kN on an area of 2 500 mm<sup>2</sup> in a square or round shape shall be assumed in all instances.

For deck surfaces exceeding the dimensions of 1 000 mm in any direction, vertical point loads of 1,5 kN shall be assumed for every additional started meter. The centers of the point loads shall have a maximum distance of 500 mm to each other.

The point load shall be assumed at the most unfavourable position of the load bearing infill.

**NOTE** This is necessary to ensure that the load bearing infill is not affected by punching shear or bending of any supporting profile caused by the point load.

#### 5.3.2.4 Horizontal equivalent loads

To achieve sufficient horizontal stiffness a distributed load acting in a horizontal direction, level with the load bearing infill, of 1/20 of the uniformly distributed vertical load in all directions shall be assumed.

For stage decks and frames equipped with vertical legs, a build height of at least 1,00 m shall be assumed. For scissor stage decks the worst case deck height shall be assumed.

### 5.4 Engineering documentation

Engineering documentation of the product designs shall be created, compiled and maintained by the manufacturer.

Engineering documentation shall include as a minimum, engineering drawings and structural analysis. Additional methods needed to validate the design shall be included.

Engineering drawings shall include dimensions, components, subassemblies, material types, self-weight, fastener types, specifications and welds as required by the EN 1090 series.

Engineering documentation shall be retained for 10 years following cessation of the production of a specific stage deck or frame.

## 6 Manufacture

### 6.1 General

The manufacturing of stage decks and frames shall maintain compliance with the applicable standards of the EN 1090 series.

Stage decks and frames shall be classified accordingly to consequence class CC2 and service category SC1 and shall be manufactured accordingly to execution class EXC2.

### 6.2 Materials

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#### 6.2.1 General

Steel alloy shall conform to the demands of the EN 1993 series and EN 1090-2.

Aluminium alloy shall conform to the demands of the EN 1999 series and EN 1090-3.

Timber shall conform to the demands of the EN 1995 series.

All aluminium alloy shall be accompanied by inspection certificates 3.1 as defined by EN 10204.

Alternative materials used in the manufacture of stage decks and frames should only be selected if an appropriate validation for its use is available.

NOTE 1 Regulation (EC) No 1907/2006 (REACH) applies with regard to dangerous substances.

NOTE 2 Prohibited materials include, but are not limited to, asbestos, lead, formaldehyde, coal tar oils, carbolineum, polycyclic aromatic hydrocarbons (PAH) and polychlorinated biphenyl (PCB).

#### 6.2.2 Fire behaviour

Load bearing infills of stage decks and frames shall have a fire retardancy consistent with a normal level of inflammability.

#### 6.2.3 Surface condition

All surfaces of stage decks, ramps, steps and stairs shall be free of hazards, e.g. splinters, trip hazards and sharp edges.