



SLOVENSKI STANDARD
oSIST prEN 16893:2015
01-september-2015

Ohranjanje kulturne dediščine - Novi kraji in stavbe, namenjeni za shranjevanje in uporabo zbirk

Conservation of Cultural Heritage - New sites and buildings intended for the storage and use of collections

Erhaltung des kulturellen Erbes - Neue Stätten und Gebäude für die Lagerung und Nutzung von Sammlungen

Conservation du patrimoine culturel - Nouveaux sites et bâtiments destinés au stockage et à l'utilisation de collections

Ta slovenski standard je istoveten z: prEN 16893

ICS:

97.195 Umetniški in obrtniški izdelki Items of art and handicrafts

oSIST prEN 16893:2015

en,fr,de

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

DRAFT
prEN 16893

July 2015

ICS 97.195

English Version

Conservation of Cultural Heritage - New sites and buildings intended for the storage and use of collections

Conservation du patrimoine culturel - Nouveaux sites et
bâtiments destinés au stockage et à l'utilisation de
collections

Erhaltung des kulturellen Erbes - Neue Stätten und
Gebäude für die Lagerung und Nutzung von Sammlungen

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 346.

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, 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: Avenue Marnix 17, B-1000 Brussels

Contents

Page

Foreword	5
Introduction.....	6
1 Scope	7
2 Normative references.....	7
3 Terms and definitions	7
4 Principles and strategies	10
4.1 Sustainability	10
4.2 Risk management.....	11
4.2.1 General	11
4.2.2 Hazards to Collections.....	11
4.3 Environmental strategy	11
4.3.1 General	11
4.3.2 Collection information	12
4.3.3 Specifications for environmental protection	12
4.4 Environmental monitoring strategy.....	12
4.5 Facilities management strategy.....	13
5 Building specifications	13
5.1 Building location	13
5.1.1 Hazards identification	13
5.1.2 Natural hazards.....	14
5.2 Site capacity.....	14
5.2.1 General	14
5.2.2 Self-containment	15
5.3 Building Structure and Environmental Protection.....	15
5.3.1 General	15
5.3.2 Passive or low-energy environment structures	15
5.3.3 Construction Materials	16
5.3.4 Building acclimatization	16
5.4 Air Quality	17
5.4.1 General	17
5.4.2 External pollutants	17
5.4.3 Internal Pollutants	17
5.4.4 Ventilation	18
5.5 Mechanical environmental control	18
5.5.1 General	18
5.5.2 Air conditioning for storage repositories	19
5.6 Prevention of infestation by pests and mould	19
5.7 Structural fire resistance	20
5.7.1 General	20
5.7.2 Fire resistance	21
5.7.3 Fire compartments	21
5.7.4 Doors and other openings.....	21
5.7.5 Vertical openings.....	21
5.8 Protection against water.....	21
5.8.1 Design and materials	21
5.8.2 Rainwater discharge systems.....	22
5.8.3 Drainage and piping work	22
5.9 Windows and lighting	22
5.9.1 General	22
5.9.2 Glazing and light levels	22

5.9.3	Lighting	22
5.9.4	Lamps	23
5.10	Electrical circuits	23
5.11	Wiring	23
5.12	Emergency electrical supply	23
5.13	Ceilings	23
5.14	Floors and load distribution	23
5.14.1	General	23
5.14.2	Calculation of floor loads	24
5.15	Storage space arrangements	24
5.16	Storage	25
5.16.1	Planning	25
5.16.2	Uprights	25
5.16.3	Shelves	25
5.16.4	Shelf material	26
5.16.5	Access to shelves	26
5.16.6	Mobile shelf units	26
5.16.7	Fire control and mobile shelves	27
5.16.8	Cantilever shelves	27
5.16.9	Plan chest and cabinets	27
6	Fire protection and prevention	28
6.1	General	28
6.2	Fire risk assessment	28
6.3	Minimizing fire hazard in an electrical system	28
6.3.1	General	28
6.3.2	Installations	29
6.3.3	Cables	29
6.3.4	Master switches	29
6.3.5	Electrical fittings	29
6.4	Minimizing fire hazards in ventilation plant and equipment	29
6.4.1	Connecting spaces	29
6.4.2	Dampers	29
6.5	Fire detection and firefighting	29
6.5.1	General	29
6.5.2	Detection and alarm systems	29
6.5.3	Monitoring	30
6.5.4	Automatic fire-fighting systems	30
6.5.5	Portable fire extinguishers	30
6.5.6	Protection of areas adjacent to collection spaces	30
6.5.7	Smoke extraction	30
7	Security specifications	30
7.1	General	30
7.2	Security of the storage building site	31
7.3	Protection against intruders	31
7.4	Entrances	31
7.5	Services	31
7.6	Windows	31
7.7	External doors to the building	32
Annex A	(informative) Automatic Fire-fighting Systems	33
A.1	General	33
A.2	Combustible materials	33
A.3	Inert gas systems	33
A.4	Overpressure	33
A.5	Reduced oxygen systems	34
A.6	Water-mist systems	34
Annex B	(informative) Relative risk of damage and deterioration due to temperature	35

prEN 16893:2015 (E)

Annex C (informative) Relative risk of damage and deterioration due to relative humidity	36
Annex D (informative) Approximate threshold concentrations for certain pollutant-material interactions	37
Annex E (informative) Light Sensitivity	38
Bibliography.....	39

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 16893:2018

<https://standards.iteh.ai/catalog/standards/sist/d7eca7d4-8449-4ece-892c-53d05a96141f/sist-en-16893-2018>

Foreword

This document (prEN 16893:2015) has been prepared by Technical Committee CEN/TC 346 “Conservation of Cultural Heritage”, the secretariat of which is held by UNI.

This document is currently submitted to the CEN Enquiry.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 16893:2018

<https://standards.iteh.ai/catalog/standards/sist/d7eca7d4-8449-4ece-892c-53d05a96141f/sist-en-16893-2018>

Introduction

Cultural heritage collections are intended to be kept indefinitely, for the benefit of future as well as current generations. Their long-term conservation can only be achieved if the sites and buildings that house them support this goal and do not place them at risk. Building features that are intended to protect collections are primarily structural, involving resilience against external and internal hazards including fire, water, pests, criminal activity and environments that interact with heritage materials.

Environmental considerations for collections are influenced by the nature of their materials, their condition and the uses to which they are put. They are also influenced by policies relating to conservation objectives, such as longevity of collections, and by the nature and costs of energy required to achieve these objectives. This draft standard assists custodians of cultural heritage collections by defining the criteria and information necessary to make policy relating to conservation that will in turn influence the outcome of building construction. It is also intended to help them define the specifications necessary for the construction or modification of buildings such that they can safely house collections. These specifications should be used by architects, engineers and others responsible for the design and construction of new archives, libraries and museums, or modifying spaces within existing buildings for these purposes.

Furthermore, two new standards/guidelines are under development in CEN/TC 346 that will add to this standard:

- *Conservation of Cultural Heritage — Risk assessment methodology for movable cultural heritage;*
- *Conservation of Cultural Heritage — Emergency and contingency plan.*

ITeH STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 16893:2018

<https://standards.iteh.ai/catalog/standards/sist/d7eca7d4-8449-4ece-892c-53d05a96141f/sist-en-16893-2018>

1 Scope

This draft European Standard gives specifications and guidance for the location, construction or adaptation of any form of building, or spaces within an existing building, specifically intended for internal storage and use of all heritage collection types and formats (where use includes display or handling, etc.).

Clauses relating to risks associated with security, environmental hazards, fire, water and pests apply to buildings as a whole and to any room in which collections may be held. This standard applies to buildings where collections are housed permanently and can be used as guidance for shorter-term display spaces where appropriate.

Some of the clauses in this standard are applicable in protected historic buildings that contain collections. In these settings, the scope for any alterations or achievement of conditions suitable for collections may be limited by the historic character of the structure.

This draft European Standard should be seen as supplementary to national or local building regulations and specifications.

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 779, *Particulate air filters for general ventilation — Determination of the filtration performance*

EN 1838, *Lighting applications — Emergency lighting*

EN 12056-3, *Gravity drainage systems inside buildings — Part 3: Roof drainage, layout and calculation*

CEN/TS 16163, *Conservation of Cultural Heritage — Guidelines and procedures for choosing appropriate lighting for indoor exhibitions*

ISO 15686-5, *Buildings and constructed assets — Service-life planning — Part 5: Life-cycle costing*

3 Terms and definitions

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

3.1

air-conditioning

mechanical system that maintains predetermined control of temperature, humidity, air quality and air distribution

3.2

air infiltration

uncontrolled leakage of air through unsealed points and permeable building materials into a building envelope

3.3

aisle

space giving direct access to picking or loading faces

[SOURCE: EN 15878:2010, 3.2.17, modified — The defined term was "operating aisle".]

prEN 16893:2015 (E)

3.4

aspirating smoke detection system

automatic fire detection system in which a sample of the atmosphere in the protected space is drawn by a fan or pump into a fire detector which may be remote from the protected space

3.5

automatic fire-fighting system

integrated system within a building, designed to control, suppress or extinguish a fire, activated by detection systems

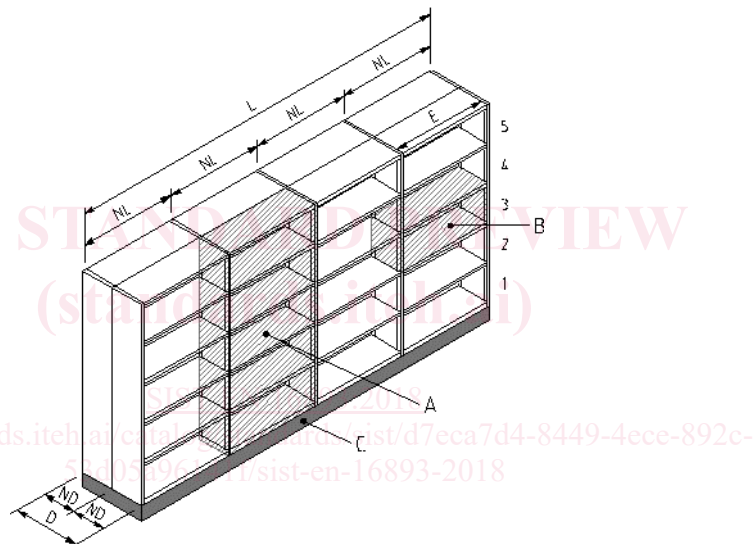
3.6

bay

unit of shelves consisting of horizontal shelves between a pair of uprights or upright frames

Note 1 to entry: See Figure 1.

Note 2 to entry: These units may be single- or double-sided.

**Key**

A	bay	E	clear entry of shelf compartment
B	shelf compartment	L	run
C	carriage	NL	nominal length of bay
D	shelf depth (overall depth of double-entry run)	ND	nominal depth of compartment

Figure 1 — Standard shelf unit terminology

3.7

Building Management System**BMS**

computer-based control system installed in buildings that controls and monitors the building's mechanical and electrical equipment such as ventilation, lighting, power systems, fire systems, and security systems

3.8

bund

structural upstand that can contain water within a defined space in the event of a flood

3.9

Closed Circuit Television (CCTV) system

system consisting of camera equipment and/or other image-capture devices, detector(s), monitoring and associated equipment for transmission and controlling purposes

[SOURCE: EN 50132-7:2012, 3.1.8, modified — The content of the definition was changed; and EN 62676-1-1:2014, 3.1.24, modified — The term that was defined was "VSS", the content of the definition was changed and the original Note to the definition is not reproduced here.]

3.10

collection

group of objects having shared or combined significance

Note 1 to entry: The term "collection" is mainly used within "movable cultural heritage".

3.11

conservation

measures and actions aimed at safeguarding cultural heritage (including documents) while respecting its significance, including its accessibility to present and future generations

3.12

preventive conservation

indirect measures and actions aimed at avoiding and minimizing future deterioration, damage and loss

3.13

remedial conservation

actions applied to an object to prevent or arrest damaging processes

3.14

cooling load

power demand (measured in kilowatts) that is imposed upon an air-conditioning system in maintaining the repository at the required level of temperature and RH

3.15

environment

surroundings of an object, some aspects of which may affect its condition

Note 1 to entry: Such aspects can be of human, physical, chemical, biological or climatic origin.

3.16

environmental control

management of one or more factors of the environment

Note 1 to entry: This applies to temperature, relative humidity, light, pollution, etc.

3.17

fire resistance

ability of a building component or construction to withstand the passage of flames and hot gases and temperature rise for a stated period, including load-bearing capacity, integrity and insulation

3.18

gangway

space for movement or transport but not giving direct access to picking or loading faces

[SOURCE: EN 15878:2010, 3.2.19]

Note 1 to entry: The gangway is measured as the narrowest space between any protruding surfaces, including hand-crankes or hand-wheels on mobile shelves.

3.19

monitoring

process of measuring, surveying and assessing the material properties of objects and/or factors of the environment over time

prEN 16893:2015 (E)**3.20****object**

single manifestation of tangible cultural heritage

Note 1 to entry: The term “object” is used in this standard for cultural heritage, both immovable and movable. In specific professional contexts, other terms are used: e.g. “artefact”, “cultural property”, “item”, “ensemble”, “site”, “building”, “fabric”.

3.21**pre-action sprinkler**

dry sprinkler system or one in dry mode in which the alarm valve can be opened by an independent fire detection system in the protected area

3.22**relative humidity**

RH

ratio, defined as a percentage, of the existing partial vapour pressure of water to the vapour pressure at saturation

Note 1 to entry: It is usually, but not always, equal to the percentage of the amount of moisture in the air to that at saturation.

[SOURCE: ISO 18934:2011, 3.13, modified — The end of the definition was altered.]

3.23**repository**

building, part of a building, or area(s) within a building designated for the long-term storage of collections

Note 1 to entry: The term repository is not intended to embrace other associated functions such as reading rooms, display areas and offices within the same building.

3.24**risk assessment**

identification, analysis and evaluation of threats that might alter significance, and the probability of their occurrence

Note 1 to entry: Risk assessment is part of the overall process of “risk management” [ISO/IEC Guide 73:2002, 3.1.7].

3.25**sprinkler system**

system of water pipes fitted with sprinkler heads at set intervals and heights, designed to detect, control or extinguish a fire by the automatic discharge of water

3.26**Whole Life Cost**

WLC

total cost of ownership over the life of an asset, in this context a building

Note 1 to entry: Typical costs include planning, design, construction, operation, maintenance, renewal, eventual demolition, build cost and depreciation.

4 Principles and strategies**4.1 Sustainability**

As cultural heritage collections are intended to be preserved, buildings intended to house them shall be designed to have a long life. Whether planning a new building or the refurbishment of an existing building, the whole life cost (WLC) shall be evaluated and used as a basis for decision-making. The projected

energy use, water consumption, carbon emissions and maintenance costs over the life of a building should be included, in addition to capital costs.

Planning for any new or refurbished building or space shall be directed at determining whether collections can be protected through passive or low energy means wherever possible. Wherever a collection requires ongoing energy use (e.g. heating, freezer storage, etc.), the use of renewable energy sources should be explored in the first instance.

Consideration of a site should take account of the potential energy consumption of users travelling to the location. For example, a remote location may be low risk but it may increase energy consumption, so the balance of risk over ease of accessibility should be assessed.

Assessment of costs associated with construction shall comply with ISO 15686-5.

4.2 Risk management

4.2.1 General

The choice of where a heritage collection building is constructed or maintained and the nature of the environment to be achieved inside the building shall be determined by an initial risk assessment and ongoing assessments over time. Information and data need to be gathered and assessed in order to formulate a policy for intended environment, security, fire and flood protection inherent in the building design or continued use. As part of the risk assessment, the following methodology and steps shall be included.

4.2.2 Hazards to Collections

The nature and use of collections define requirements for the qualities and design of a building in which they will be placed. The organization shall identify the hazards that affect its collections and assess the likelihood and impact of those hazards occurring. The following hazards are common to cultural heritage collections and shall be assessed:

- a) environment (internal and external): temperature, humidity, light and pollution including gaseous and particulate (see Annexes B, C, D and E for information regarding environmental risks and sensitivities of collection materials),
- b) bio deterioration (pests and mould);
- c) theft, robbery,
- d) vandalism;
- e) fires,
- f) water (fresh water supply and wastewater);
- g) natural events (torrential rain, flooding, landslide, earthquake, etc.).

The hazards associated with the location of a building shall be identified in accordance with 5.1. The location of activities and services that may create a hazard, e.g. kitchens, laboratories, needs to be taken into account.

4.3 Environmental strategy

4.3.1 General

An environmental management strategy for the collection shall be developed, based on an assessment of the needs of the collections. The strategy shall include a statement of the expected collection lifetime and