SLOVENSKI STANDARD
SIST EN 15759-2:2018

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Ohranjanje kulturne dediščine - Notranje okolje - 2. del: Prezračevanje za zaščito stavb in zbirk kulturne dediščine

Conservation of cultural heritage - Indoor climate - Part 2: Ventilation to protect heritage buildings and collections

Erhaltung des kulturellen Erbes - Raumklima - Teil 2: Lüftung für den Schutz von Gebäuden und Sammlungen des kulturellen Erbes

Conservation du patrimoine culturel - Climat intérieur - Partie 2 : Ventilation destinée à protéger les bâtiments et les collections appartenant au patrimoine

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91.140.30	Prezračevalni in klimatski sistemi	Ventilation and air-conditioning systems
97.195	Umetniški in obrtniški izdelki. Kulturne dobrine in kulturna dediščina	Items of art and handicrafts. Cultural property and heritage

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EUROPEAN STANDARD

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English Version

Conservation of cultural heritage - Indoor climate - Part 2: Ventilation management for the protection of cultural heritage buildings and collections

Conservation du patrimoine culturel - Climat intérieur - Partie 2 : Ventilation destinée à protéger les bâtiments et les collections appartenant au patrimoine

Erhaltung des kulturellen Erbes - Raumklima - Teil 2: Lüftung für den Schutz von Gebäuden und Sammlungen des kulturellen Erbes

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COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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European foreword

This document (EN 15759-2:2018) has been prepared by Technical Committee CEN/TC 346 “Conservation of Cultural Heritage”, 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of an identical text or by endorsement, at the latest by July 2018, and conflicting national standards shall be withdrawn at the latest by July 2018.

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Introduction

The aim of the ventilation management is to ensure the optimum preservation of cultural heritage buildings and collections, and to provide human comfort.

Indoor climate is influenced by the variations of outdoor climate and the properties of the building envelope: air tightness, insulation and hygrothermal buffering. An inadequate indoor climate may result to significant damage on buildings and their collections. Building operations such as opening of doors or windows, presence of visitors, heating or cooling to ensure human comfort, or lighting with incandescence lamps, also affect the indoor climate. Controlling the level of pollutants generated both externally and internally could further improve indoor air quality.

Air exchange, in the form of active ventilation, natural ventilation and infiltration as well as internal air circulation are only two of many factors whose complex interaction determines indoor climate; however, they are fundamental for providing a conservation safe indoor environment. The aim of this standard is to describe procedures for the ventilation management for the protection of cultural heritage. However, environmentally induced risks can only be mitigated with an integrated risk management plan of which ventilation is one element.

This standard is addressed to building owners, authorities and professionals involved in preservation, conservation and refurbishment of cultural heritage buildings and their content, or modern buildings housing collections. It aims at facilitating the sustainable management of these buildings by integrating measures for energy performance and reduction of greenhouse gas emissions.

1 Scope

This European Standard gives guidelines for ventilation management in order to improve the preservation conditions of cultural heritage buildings and their collections. At the same time, it is aimed to create an indoor environment for a sustainable use of these buildings and their collections. This standard is a complement to existing general standards for ventilation that are focused on human comfort.

This European Standard is the second part of a standard on indoor climate in cultural heritage buildings, i.e. EN 15759-1:2011. It should be used together with the first part when considering selection of heating strategies and heating systems for cultural heritage buildings, or buildings housing collections. It may be also used when considering other issues, e.g. assessment of buildings, interiors and contents, or improvements for the energy performance.

This European Standard deals with indoor climate conditions, ventilation strategies and generic technical solutions for their implementation but not with the technical equipment itself.

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 15757:2010, *Conservation of Cultural Property — Specifications for temperature and relative humidity to limit climate-induced mechanical damage in organic hygroscopic materials*

EN 15758:2010, *Conservation of Cultural Property — Procedures and instruments for measuring temperatures of the air and the surfaces of objects*

EN 15759-1:2011, *Conservation of cultural property — Indoor climate — Part 1: Guidelines for heating churches, chapels and other places of worship*

EN 15898:2011, *Conservation of cultural property — Main general terms and definitions*

EN 16095, *Conservation of cultural property — Condition recording for movable cultural heritage*

EN 16096, *Conservation of cultural property — Condition survey and report of built cultural heritage*

EN 16242:2012, *Conservation of cultural heritage — Procedures and instruments for measuring humidity in the air and moisture exchanges between air and cultural property*

EN ISO 12569, *Thermal performance of buildings and materials — Determination of specific airflow rate in buildings — Tracer gas dilution method (ISO 12569)*

EN ISO 16000-1, *Indoor air — Part 1: General aspects of sampling strategy (ISO 16000-1)*

ISO 16000-8, *Indoor air — Part 8: Determination of local mean ages of air in buildings for characterizing ventilation conditions*

3 Terms and definitions

For the purposes of this document, general terms and definitions concerning conservation of cultural heritage given in EN 15898:2011 and the following apply.

3.1
air circulation
motion of air in a given space or through an opening

3.2
air exchange
air volume added to or removed from a space

Note 1 to entry: It can be due to ventilation or infiltration.

Note 2 to entry: This is expressed in m^3.

3.3
air exchange rate
rate at which air enters or leaves the building

Note 1 to entry: This is expressed as the volume of outdoor air passing an indoor space per hour, divided by the volume of the space, in air changes per hour, h^{-1}.

3.4
air pollutant
material emitted into the atmosphere either by human activity or natural processes and adversely affecting humans or the environment

[SOURCE: ISO 18158:2016, 2.1.2.1]

Note 1 to entry: In this standard, the adverse effects on cultural heritage are particularly relevant.

3.5
air temperature
T
temperature read on a thermometer which is exposed to air in a position sheltered from direct solar radiation or other energy sources

Note 1 to entry: This is expressed in degrees Celsius (°C)

[SOURCE: EN 15758:2010, 3.1]

3.6
airborne particles
fine matter in solid or liquid form dispersed in air

[SOURCE: ISO 18158:2016, 2.1.2.3]

3.7
building fabric
basic structure of a building

3.8
conservation
measures and actions aimed at safeguarding cultural heritage while respecting its significance, including its accessibility to present and future generations

Note 1 to entry: Conservation includes “preventive conservation”*, “remedial conservation”* and “restoration”*.

Note 2 to entry: Derived from IC OM-CC 2008 New Delhi Resolution.

Note 3 to entry: The intention is generally to ensure access, intellectual and/or physical, now and/or in the future.

[SOURCE: EN 15898:2011, 3.3.1]

3.9
cultural heritage
tangible and intangible entities of significance to present and future generations

Note 1 to entry: Significance can derive from – among others – artistic, symbolic, historic, social, scientific or technological factors.

[SOURCE: EN 15898:2011, 3.1.1]

3.10
dew-point temperature
temperature to which air is cooled at constant pressure and constant water vapour content in order for saturation to occur

Note 1 to entry: This is expressed in degrees Celsius (°C).

[SOURCE: EN 15758:2010, 3.6]

3.11
heating, ventilating or air conditioning systems
HVAC systems
active systems operated to control air temperature (heating), air temperature and humidity (air conditioning) or ventilation in a building

[SOURCE: EN 15757:2010, 3.4]

3.12
indoor climate
climate inside a room or a building

[SOURCE: EN 15759-1:2011, 3.8]

3.13
infiltration
unintentional or accidental introduction of outdoor air into a building through gaps in the building envelope, often located in the frames and fittings of doors and windows

3.14
microclimate
climate in part of a building or a room where the climate differs from the surrounding climate

[SOURCE: EN 15759-1:2011, 3.11]

3.15
mixing ratio or **humidity mixing ratio**
MR

ratio of the mass of water vapour m_v to the mass of dry air m_a, i.e. $MR = \frac{m_v}{m_a}$, expressed in g/kg

[SOURCE: EN 16242:2012, 3.12]

3.16
natural ventilation
ventilation caused by environmental factors, e.g. wind, temperature and pressure differences, diffusion, through doors, windows or other intentional openings in a building

3.17
outdoor climate
climate outside of the building

[SOURCE: EN 15759-1:2011, 3.14]

3.18
preservation heating
heating used to improve the indoor climate for preservation purposes

[SOURCE: EN 15759-1:2011, 3.1]

3.19
programmable control system
system that continuously measures climate parameters and then automatically steers technical devices to correct deviations from pre-set values using individual algorithms

3.20
relative humidity
RH
ratio of the actual water vapour pressure to the saturation water vapour pressure

[SOURCE: EN 15757:2010, 3.9]

3.21
surface temperature
TS
temperature of a given surface of an object

[SOURCE: EN 15758:2010, 3.18]

Note 1 to entry: This can be measured with contact thermometers, quasi-contact total radiation thermometers or remote infrared thermometers. The surface temperature is generally different from the air temperature, and varies between different objects and different areas on the same object. It is expressed in degrees Celsius (°C). In general, the measured surface temperature is not representative of the whole object.

3.22
ventilation
process of supplying outside air or removing inside air by natural or mechanical means to or from a room or building