

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

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN 15759-2:2018 sisaldab Euroopa standardi EN 15759-2:2018 ingliskeelset teksti.	This Estonian standard EVS-EN 15759-2:2018 consists of the English text of the European standard EN 15759-2:2018.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 10.01.2018.	Date of Availability of the European standard is 10.01.2018.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

ICS 97.195

Standardite reprodutseerimise ja levitamise õigus kuulub Eesti Standardikeskusele

Andmete paljundamine, taastekitamine, kopeerimine, salvestamine elektroonsesse süsteemi või edastamine ükskõik millises vormis või millisel teel ilma Eesti Standardikeskuse kirjaliku loata on keelatud.

Kui Teil on küsimusi standardite autorikaitse kohta, võtke palun ühendust Eesti Standardikeskusega:
Koduleht www.evs.ee; telefon 605 5050; e-post info@evs.ee

The right to reproduce and distribute standards belongs to the Estonian Centre for Standardisation

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, without a written permission from the Estonian Centre for Standardisation.

If you have any questions about copyright, please contact Estonian Centre for Standardisation:

Homepage www.evs.ee; phone +372 605 5050; e-mail info@evs.ee

ICS 97.195

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

This European Standard was approved by CEN on 20 November 2017.

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, Serbia, 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: Rue de la Science 23, B-1040 Brussels

Contents

Page

European foreword.....	4
Introduction	5
1 Scope.....	6
2 Normative references.....	6
3 Terms and definitions	6
4 Step-by-step approach to managing ventilation.....	10
5 Analysis of ventilation-related risks.....	11
5.1 General.....	11
5.2 Ventilation-related risks	11
5.2.1 General.....	11
5.2.2 Excessive RH fluctuations	12
5.2.3 High RH levels.....	12
5.2.4 Low RH levels.....	12
5.2.5 Moisture condensation	12
5.2.6 Water evaporation and salt damage.....	12
5.2.7 Transport and deposition of air pollutants.....	12
5.3 Assessing the ventilation-related risks.....	12
5.3.1 General.....	12
5.3.2 Condition survey	13
5.3.3 Determination of air exchange rate	13
5.3.4 Assessment of indoor air quality.....	13
6 Ventilation objective.....	13
7 Requirements for indoor air quality.....	14
7.1 General.....	14
7.2 Indoor climate.....	14
7.3 Air pollutants.....	14
8 Ventilation management recommendations	15
8.1 General.....	15
8.2 Simple adjustments improving the indoor climate	15
8.3 Technical installations.....	15
8.4 Programmable control systems.....	15
8.5 Monitoring systems.....	16
8.6 Complementary measures.....	16
8.6.1 General.....	16
8.6.2 Preservation heating	16
8.6.3 Humidification, dehumidification.....	16
8.6.4 Showcases.....	17
9 Ventilation management measures implementation	17
10 Ventilation management measures evaluation	17
Annex A (informative) Examples.....	18
A.1 General.....	18

A.2	Cultural heritage building housing a museum with a mixed collection	18
A.3	Modern storage facility for archival and library materials using passive climate control.....	20
	Annex B (informative) Technical aspects	21
	Bibliography	22

This document is a preview generated by EVS

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.

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

According to the CEN/CENELEC Internal Regulations, the national standards organizations 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, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

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.