SVENSK STANDARD
SS-EN 15759-1:2011

Fastställd/Approved: 2011-12-08
Publicerad/Published: 2012-01-17
Utgåva/Edition: 1
Språk/Language: engelska/English
ICS: 97.195

Bevarande av kulturarv – Specifikationer för styrning av inomhusklimat –
Del 1: Riktlinjer för uppvärmning av kyrkor, kapell och andra platser av sakral betydelse

Conservation of cultural property – Indoor climate –
Part 1: Guidelines for heating churches, chapels and other places of worship

Standarder får världen att fungera

SIS (Swedish Standards Institute) är en fristående ideell förening med medlemmar från både privat och offentlig sektor. Vi är en del av det europeiska och globala nätverk som utarbetar internationella standarder. Standarder är dokumenterad kunskap utvecklad av framstående aktörer inom industri, näringsliv och samhälle och befrämjar handel över gränser, bidrar till att processer och produkter blir säkrare samt effektiviserar din verksamhet.

Delta och påverka
Som medlem i SIS har du möjlighet att påverka framtida standarder inom ditt område på nationell, europeisk och global nivå. Du får samtidigt tillgång till tidig information om utvecklingen inom din bransch.

Ta del av det färdiga arbetet
Vi erbjuder våra kunder allt som rör standarder och deras tillämpning. Hos oss kan du köpa alla publikationer du behöver – allt från enskilda standarder, tekniska rapporter och standard-paket till handböcker och onlinetjänster. Genom vår webbtjänst e-nav får du tillgång till ett lättnavigerat bibliotek där alla standarder som är aktuella för ditt företag finns tillgängliga. Standarder och handböcker är källor till kunskap. Vi säljer dem.

Utveckla din kompetens och lyckas bättre i ditt arbete
Hos SIS kan du gå öppna eller företagsinterna utbildningar kring innehåll och tillämpning av standarder. Genom vår närhet till den internationella utvecklingen och ISO får du rätt kunskap i rätt tid, direkt från källan. Med vår kunskap om standarders möjligheter hjälper vi våra kunder att skapa verklig nytta och lönsamhet i sina verksamheter.

Vill du veta mer om SIS eller hur standarder kan effektivisera din verksamhet är du välkommen in på www.sis.se eller ta kontakt med oss på tel 08-555 523 00.

Standards make the world go round

SIS (Swedish Standards Institute) is an independent non-profit organisation with members from both the private and public sectors. We are part of the European and global network that draws up international standards. Standards consist of documented knowledge developed by prominent actors within the industry, business world and society. They promote cross-border trade, they help to make processes and products safer and they streamline your organisation.

Take part and have influence
As a member of SIS you will have the possibility to participate in standardization activities on national, European and global level. The membership in SIS will give you the opportunity to influence future standards and gain access to early stage information about developments within your field.

Get to know the finished work
We offer our customers everything in connection with standards and their application. You can purchase all the publications you need from us - everything from individual standards, technical reports and standard packages through to manuals and online services. Our web service e-nav gives you access to an easy-to-navigate library where all standards that are relevant to your company are available. Standards and manuals are sources of knowledge. We sell them.

Increase understanding and improve perception
With SIS you can undergo either shared or in-house training in the content and application of standards. Thanks to our proximity to international development and ISO you receive the right knowledge at the right time, direct from the source. With our knowledge about the potential of standards, we assist our customers in creating tangible benefit and profitability in their organisations.

If you want to know more about SIS, or how standards can streamline your organisation, please visit www.sis.se or contact us on phone +46 (0)8-555 523 00

Europastandarden EN 15759-1:2011 gäller som svensk standard. Detta dokument innehåller den officiella engelska versionen av EN 15759-1:2011.

The European Standard EN 15759-1:2011 has the status of a Swedish Standard. This document contains the official version of EN 15759-1:2011.

Upplysningar om sakinnehållet i standarden lämnas av SIS, Swedish Standards Institute, telefon 08-555 520 00. Standarder kan beställas hos SIS Förlag AB som även lämnar allmänna upplysningar om svensk och utländsk standard.

Information about the content of the standard is available from the Swedish Standards Institute (SIS), telephone +46 8 555 520 00. Standards may be ordered from SIS Förlag AB, who can also provide general information about Swedish and foreign standards.

Denna standard är framtagen av kommittén för Bevarande av kulturarv, SIS/TK 479.

Har du synpunkter på innehållet i den här standarden, vill du delta i ett kommande revideringsarbete eller vara med och ta fram andra standarder inom området? Gå in på www.sis.se - där hittar du mer information.

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 15759-1

November 2011

ICS 97.195

English Version

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

Conservation des biens culturels - Environnement intérieur - Partie 1 : Recommandations pour le chauffage des églises, chapelles et autres édifices cultuels

Erhaltung des kulturellen Erbes - Raumklima - Teil 1: Leitfäden für die Beheizung von Andachtsstätten

This European Standard was approved by CEN on 8 October 2011.

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, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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

Management Centre: Avenue Marnix 17, B-1000 Brussels

Ref. No. EN 15759-1:2011: E

Contents

Page

Foreword

This document (EN 15759-1:2011) has been prepared by Technical Committee CEN/TC 346 “Conservation of cultural property”, 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 May 2012, and conflicting national standards shall be withdrawn at the latest by May 2012.

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.

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, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

Introduction

Churches, chapels and other places of worship such as mosques and synagogues (referred to collectively in the text of this standard as “places of worship”) are an important part of European cultural heritage. The buildings and their interiors, containing cultural heritage objects, are documents of our heritage that society agrees need to be preserved for present and future generations. The indoor climate is a critical factor in conserving the fabric of buildings and the objects they house.

This European Standard is motivated by the need to reflect the special characteristics of places of worship, conditions which are not addressed in standards for the heating of other kinds of buildings. The defining characteristics of these buildings are their construction (often early building techniques); the fact that they were not designed as living or working spaces; their intermittent use; and the vulnerability of their surface decoration and contents. Originally, most historic places of worship had little or no heating. Nowadays, buildings in cold climate regions may be heated in order to:

a) provide thermal comfort for worshippers, staff and visitors (referred collectively in this text as “users”);

b) improve the indoor climate conditions for the conservation of the building and its contents;

c) achieve a combination of (a) and (b) in buildings where both conservation and thermal comfort have to be considered.

The conventional climate requirements for thermal comfort can sometimes be in conflict with the requirements for conservation and may therefore call for compromise.

A decision on changing or replacing the heating system in a place of worship generally depends on a variety of factors: the pattern of use of the building (e.g. frequency, numbers of users, opening hours for visitors), its liturgical uses, the significance, condition, and vulnerability of the building and its often valuable contents, thermal comfort of the users, costs (installation, operation and maintenance), energy efficiency and sustainability, visual and audible impact, aesthetics, impact on the building structure, safety, and national laws and regulations.

This standard provides guidelines in order to facilitate the best possible decision on behalf of the end users. The standard is divided into the following steps:

a) assessment of the building, its interior and contents;

b) determine an indoor climate specification with respect to conservation and thermal comfort;

c) determine an appropriate heating strategy;

d) select and design an appropriate heating system;

e) implement the proposed changes;

f) evaluate the effectiveness of the heating system with respect to the specification.

This is the first standard in a series of standards on indoor climate and climate control in cultural heritage buildings. The air exchange of a building has a fundamental influence on its indoor climate and climate control; general considerations are given in Clause 5. Ventilation will be dealt with fully in the second part of the series of standards on indoor climate in cultural heritage buildings, prEN 15759-2, *Conservation of cultural property — Indoor climate — Part 2: Ventilation*.

1 Scope

This European Standard provides guidelines for the selection of heating strategies and heating systems in churches, chapels and other places of worship such as mosques and synagogues, in order to prevent damage to cultural property while at the same time creating an indoor climate that allows for a sustainable use of these buildings. It applies to most kinds of places of worship regardless of size and construction. This European Standard applies not only to the introduction of new heating systems but also to the replacement of old ones.

This European Standard applies to buildings that are part of cultural heritage or that house cultural heritage objects. This European Standard deals with indoor climate conditions, heating strategies and technical solutions for their implementation but not with the technical equipment itself.

2 Normative references

The following referenced documents are indispensable for the application 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 15757, *Conservation of Cultural Property — Specifications for temperature and relative humidity to limit climate-induced mechanical damage in organic hygroscopic materials*

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

prEN 16095[1)], *Conservation of cultural property — Condition report of movable heritage — Visual inspection and description of the condition of movable heritage*

prEN 16096[1)], *Conservation of cultural property — Condition survey of immovable heritage*

prEN 16242[1)], *Conservation of cultural property — Procedures and instruments for measuring humidity in the air and moisture exchanges between air and cultural property*

EN ISO 7730, *Ergonomics of the thermal environment — Analytical determination and interpretation of thermal comfort using calculation of the PMV and PPD indices and local thermal comfort criteria (ISO 7730:2005)*

EN ISO 11079:2007, *Ergonomics of the thermal environment — Determination and interpretation of cold stress when using required clothing insulation (IREQ) and local cooling effects (ISO 11079:2007)*

3 Terms and definitions

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

3.1
climate
statistics of temperature, humidity, atmospheric pressure, wind, rainfall, and other meteorological elements in a given location over a long period of time

3.2
preservation heating
heating used to improve the indoor climate for conservation purposes

1) Under publication.

3.3
continuous heating
permanent heating of a building throughout the cold period of the year

3.4
cultural heritage
tangible and intangible entities of significance to present and future generations

3.5
dew point
temperature to which humid air must be cooled for water vapour to condense into liquid water

3.6
general heating
heating of the whole building volume

3.7
historic climate
description of the climate over a representative period of time

3.8
indoor climate
climate inside a room or a building

3.9
intermittent heating
heating of a building operated for limited periods of time

3.10
local heating
heating a limited space in the building

3.11
microclimate
climate in part of a building or a room where the climate differs from the surrounding climate

3.12
mixed mode heating
combination of continuous and intermittent heating, where the building is continually kept at a low temperature and heated to a higher temperature only when it is used

3.13
natural indoor climate
indoor climate of a building without heating, forced ventilation or any other kind of active climate control

3.14
outdoor climate
climate outside of a building

3.15
target range of RH variations
range of RH variations that must be maintained to avoid climate induced damages

3.16
thermal comfort
state of mind that expresses satisfaction with the surrounding environment

3.17
thermal stratification
vertical layering of air temperatures in a building