



National Standards Authority of Ireland

IRISH STANDARD

I.S. EN 15026:2007

ICS 91.080.01

**HYGROTHERMAL PERFORMANCE OF
BUILDING COMPONENTS AND BUILDING
ELEMENTS - ASSESSMENT OF MOISTURE
TRANSFER BY NUMERICAL SIMULATION**

National Standards
Authority of Ireland
Glasnevin, Dublin 9
Ireland

Tel: +353 1 807 3800
Fax: +353 1 807 3838
<http://www.nsai.ie>

Sales
<http://www.standards.ie>

*This Irish Standard was
published under the authority
of the National Standards
Authority of Ireland and
comes into effect on:
1 June 2007*

**NO COPYING WITHOUT NSAI
PERMISSION EXCEPT AS
PERMITTED BY COPYRIGHT
LAW**

© NSAI 2007

Price Code I

Údarás um Chaighdeáin Náisiúnta na hÉireann

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 15026

April 2007

ICS 91.080.01

English Version

**Hygrothermal performance of building components and building
elements - Assessment of moisture transfer by numerical
simulation**

Performance hygrothermique des composants et parois de
bâtiments - Evaluation du transfert d'humidité par
simulation numérique

Wärme- und feuchtetechnisches Verhalten von Bauteilen
und Bauelementen - Bewertung der Feuchteübertragung
durch numerische Simulation

This European Standard was approved by CEN on 28 February 2007.

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 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 Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, 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: rue de Stassart, 36 B-1050 Brussels

Contents

Page

Foreword	3
Introduction	4
1 Scope	5
2 Normative references	6
3 Terms, definitions, symbols and units	6
3.1 Terms and definitions	6
3.2 Symbols and units	6
4 Hygrothermal equations and material properties	8
4.1 Assumptions	8
4.2 Transport of heat and moisture	9
4.3 Material properties	11
5 Boundary conditions	13
5.1 Internal conditions	13
5.2 External conditions	14
6 Documentation of input data and results	15
6.1 General	15
6.2 Problem description	15
6.3 Hygrothermal model and numerical solution	16
6.4 Calculation report	16
Annex A (normative) Benchmark example – Moisture uptake in a semi-infinite region	18
A.1 General	18
A.2 Problem description	18
A.3 Results	19
Annex B (informative) Design of Moisture Reference Years	22
Annex C (informative) Internal boundary conditions	23
Bibliography	24

Foreword

This document (EN 15026:2007) has been prepared by Technical Committee CEN/TC 89 “Thermal performance of buildings and building components”, the secretariat of which is held by SIS.

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 October 2007, and conflicting national standards shall be withdrawn at the latest by October 2007.

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, 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.

Introduction

This standard defines the practical application of hygrothermal simulation software used to predict one-dimensional transient heat and moisture transfer in multi-layer building envelope components subjected to non steady climate conditions on either side. In contrast to the steady-state assessment of interstitial condensation by the Glaser method (as described in EN ISO 13788), transient hygrothermal simulation provides more detailed and accurate information on the risk of moisture problems within building components and on the design of remedial treatment. While the Glaser method considers only steady-state conduction of heat and vapour diffusion, the transient models covered in this standard take account of heat and moisture storage, latent heat effects, and liquid and convective transport under realistic boundary and initial conditions. The application of such models has become widely used in building practice in recent years, resulting in a significant improvement in the accuracy and reproducibility of hygrothermal simulation.

The following examples of transient, one-dimensional heat and moisture phenomena in building components can be simulated by the models covered by this standard:

- drying of initial construction moisture;
- moisture accumulation by interstitial condensation due to diffusion in winter;
- moisture penetration due to driving rain exposure;
- summer condensation due to migration of moisture from outside to inside;
- exterior surface condensation due to cooling by longwave radiation exchange;
- moisture-related heat losses by transmission and moisture evaporation.

The factors relevant to hygrothermal building component simulation are summarised below. The standard starts with the description of the physical model on which hygrothermal simulation tools are based. Then the necessary input parameters and their procurement are dealt with. A benchmark case with an analytical solution is given for the assessment of numerical simulation tools. The evaluation, interpretation and documentation of the output form the last part.

Inputs

- Assembly, orientation and inclination of building components
- Hygrothermal material parameters and functions
- Boundary conditions, surface transfer for internal and external climate
- Initial condition, calculation period, numerical control parameters

Outputs

- Temperature and heat flux distributions and temporal variations
- Water content, relative humidity and moisture flux distributions and temporal variations

Post processing

- Energy use, economy & ecology
- Biological growth, rot and corrosion
- Moisture related damage and degradation

The post processing tools are not part of this standard. As far as possible references to publications dealing with these tools is given.

This is a free preview. Purchase the entire publication at the link below:

[Product Page](#)

-
- Looking for additional Standards? Visit Intertek Inform Infostore
 - Learn about LexConnect, All Jurisdictions, Standards referenced in Australian legislation
-