SLOVENSKI STANDARD
kSIST FprEN 15254-7:2012

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Extended application of results from fire resistance tests - Non-loadbearing ceilings — Part 7: Metal sandwich panel construction

Erweiterter Anwendungsbereich der Ergebnisse von Feuerwiderstandsprüfungen - Nichttragende Unterdecken - Teil 7: Sandwichelemente in Metallbauweise

Application étendue des résultats d´essais de résistance au feu - Plafonds non porteurs Panneaux sandwiches métalliques pour la construction - Partie 7 : Panneaux sandwiches métalliques pour la construction

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ICS:

13.220.50	Požarna odpornost gradbenih materialov in elementov	Fire-resistance of building materials and elements
91.060.30	Stropi. Tla. Stopnice	Ceilings. Floors. Stairs

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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Foreword

This document (FprEN 15254-7:2011) has been prepared by Technical Committee CEN/TC 127 “Fire safety in buildings”, the secretariat of which is held by BSI.

This document is currently submitted to the Unique Acceptance Procedure.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of 89/106/EEC.

1 Scope

This European Standard defines rules for extended applications, provides guidance, and where appropriate defines procedures, for variations of certain parameters and factors associated with the design of internal non-loadbearing ceilings constructed of metal sandwich panels that have been tested in accordance with EN 1364-2.

This European Standard applies to self-supporting, double skin metal faced sandwich panels having an insulating core bonded to both facings.

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 amendment) applies.

EN 1363-1:1999, *Fire resistance tests — Part 1: General requirements*

EN 1363-2, *Fire resistance tests — Part 2: Alternative and additional procedures*

EN 1364-2:1999, *Fire resistance tests for non-loadbearing elements — Part 2: Ceilings*

EN 1993-1-2, *Eurocode 3. Design of steel structures — Part 1-2: General rules — Structural fire design*

EN 13501-2, *Fire classification of construction products and building elements — Part 2: Classification using data from fire resistance tests, excluding ventilation services*

EN 14509:2006, *Self-supporting double skin metal faced insulating panels — Factory made products — Specifications*

3 Terms, definitions, symbols and abbreviations

3.1 Terms and definitions

For the purpose of this document, the terms and definitions given in EN 14509:2006, EN 1364-2:1999 and EN 1363-1:1999 together with the following apply.

3.1.1
direct field of application of test results
outcome of a process (involving the application of defined rules) whereby a test result is deemed to be equally valid for variations in one or more of the product properties and/or intended end use applications

3.1.2
extended field of application of test results
outcome of a process (involving the application of defined rules that may incorporate calculation procedures) that predicts, for a variation of a product property and/or its intended end use application(s), a test result on the basis of one or more test results to the same test standard

3.1.3
factor
one of the possible variations that may be applied to a parameter

3.1.4
factor influence
one of the potential causes of a change in the fire resistance due to a factor

3.1.5
fastening, fixing
device that fastens the panels to a support structure or to the test frame

3.1.6
fixing system
system consisting of fastenings and possible other means to fasten the panels to a support structure or to the test frame

3.1.7
length of assembly
length of the ceiling in the span (or panel length) direction in the reference test or in the end use application

3.1.8
width of assembly
width of the ceiling in the cross direction of the span (or panel length) in the reference test or in the end use application

3.1.9
reference test
fire resistance test in accordance with EN 1363-1 and EN 1364-2, and where applicable EN 1363-2, on which the extended application is based and the results of which are used as the main source of data for the extended application

3.1.10
stiching
device for fixing panels to panels in the longitudinal joint

3.1.11
span length
center to center distance between two consecutive supports to which the sandwich panel is fixed

3.1.12
support structure
construction onto which the panel ceiling is fastened in the end use application

3.1.13
test frame
frame containing the test construction for the purpose of mounting onto the furnace

3.2 Symbols and abbreviations

For the purposes of this document, the following symbols and abbreviations apply.

F_{Ed} catenary force acting on the fasteners

F_{v} vertical force due at g acting at the fastener

F_{Ed1} catenary force acting at the fastener at maximum temperature in the test

F_{Ed2} catenary force acting at the fastener at temperature for the increased span

F_{v1} vertical force due at g acting at the fastener at maximum temperature in the test

F_{v2} vertical force due at g acting at the fastener at temperature for the increased span

L span length

T temperature

b width of panel

g panel weight per square meter

n number of fasteners

p relative en movement in the fastener

w deflection of the ceiling

α linear coefficient of thermal expansion

4 Establishing the field of extended application

4.1 General

An extended application analysis is required when the application differs in one or more parameters from the tested one described in the test report and/or in the classification document, and which is not covered by the field of direct application of the classification document.

The extended application of the sandwich panels used as a non-loadbearing ceiling shall be based on the reference fire test results performed according to EN 1364-2 and may be complemented by one or more additional small or full scale tests or by historical data. If historical data are used they shall comply with the rules given in this document.

4.2 Assumptions in the extended application

The following assumptions are considered when evaluating extended applications for sandwich panels:

— the ceiling is required to possess fire resistance in the end-use condition; relevant classes are given in EN 13501-2,

— the ceiling is assumed to be exposed on the entire face of one side (either from above or below) to the standardised heating conditions given in the EN 1363-1 fire resistance test specification,

— the structure to which the ceiling is fixed does not deflect during the fire exposure period; this simulates the non-deflecting nature of the test frame which forms part of the furnace test apparatus,

NOTE In reality constructions deflect and this should be taken into account when designing the building and planning the constructional details.

— after delamination of the fire exposed facing the dead load of the panels is carried by a support structure to which the ends of the sandwich panels are attached; the forces from the dead load will be distributed to the support structure by the panel fixings which loadbearing capacity must be evaluated,

— the support structure has at least the same loadbearing capacity R of the resistance to fire performance as the sandwich panel ceiling regarding integrity,

— the self weight of the facing and core is calculated from the volume and density of the materials,