
**Razširjena uporaba rezultatov preskusov požarne odpornosti - Nenosilni stropi - 7.
del: Konstrukcije iz kovinskih sendvič panelov**

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 -
Partie 7 : Panneaux sandwichs métalliques pour la construction

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

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résistance au feu - Plafonds non porteurs - Partie 7 :
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Metallbauweise

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 127.

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European foreword

This document (prEN 15254-7:2024) 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 CEN Enquiry.

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This document has been prepared under a standardization request addressed to CEN by the European Commission. The Standing Committee of the EFTA States subsequently approves these requests for its Member States.

This series is currently composed of the following parts:

- EN 15254-2, *Extended application of results from fire resistance tests — Non-loadbearing walls — Part 2: Masonry and Gypsum Blocks*
- EN 15254-4, *Extended application of results from fire resistance tests — Non-loadbearing walls — Part 4: Glazed constructions*
- EN 15254-5, *Extended application of results from fire resistance tests — Non-loadbearing walls — Part 5: Metal sandwich panel construction*
- EN 15254-6, *Extended application of results from fire resistance tests - Non-loadbearing walls — Part 6: Curtain walling*
- EN 15254-7, *Extended application of results from fire resistance tests — Non-loadbearing walls — Part 7: Non-load bearing sandwich panels — Ceilings*

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prEN 15254-7:2024 (E)**1 Scope**

This document defines rules for extended applications, provides guidance, and, where appropriate, specifies procedures, for variations of certain parameters and factors associated with the design of internal non-loadbearing ceilings constructed of metal faced sandwich panels that have been tested in accordance with EN 1364-2, which could generate a classification in accordance with EN 13501-2.

This document applies to, double skin metal faced sandwich panels, which have an insulating core bonded to both facings as defined in EN 14509 not stabilizing a whole building or parts of it.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 1363-1, *Fire resistance tests - Part 1: General requirements*

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

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

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

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

EN 14509:2013, *Self-supporting double skin metal faced insulating panels - Factory made products - Specifications*

prEN 14509-3:2024, *Factory-made double skin metal faced insulating sandwich panels - Part 3: Test methods for determining mechanical strength, building physical behaviour and durability*

EN 15725:2023, *Extended application on the fire performance of construction products and building elements: Principle of EXAP standards and EXAP reports*

EN ISO 13943, *Fire safety - Vocabulary (ISO 13943)*

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, EN 15725, EN 1364-2, EN 1363-1 and EN ISO 13943 the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <https://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>

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**

variation that can be applied to a parameter, e.g. a change in the core thickness

3.1.4**factor influence**

potential cause of a change in the fire resistance when the factor is changed, e.g. an increase in the loadbearing capacity R as a result of an increase in stiffness

3.1.5**fastening, fixing**

component that fastens the panels to a support structure or to the test frame

3.1.6**fixing system**

system consisting of fastenings and other possible means used 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 on which the extended application is based and the results of which are used as the main source of data for the extended application

Note 1 to entry: The fire resistance test is in accordance with EN 1363-1 and EN 1364-2, and where applicable EN 1363-2.

3.1.10**stitching**

component for fixing panels to panels in the longitudinal joint

prEN 15254-7:2024 (E)**3.1.11****span length**

centre to centre 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**supporting construction**

construction that may be required for the testing of some building elements into which the test specimen is assembled

3.1.14**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.

b width of panel

d_c depth of core

F_{Ed} catenary force acting on the fasteners

F_V vertical force due to 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 to g acting at the fastener at maximum temperature in the test

F_{V2} vertical force due to g acting at the fastener at temperature for the increased span

g panel weight per square meter

L span length

n number of fasteners

p relative end movement in the fastener

T temperature

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 one tested and described in the test report and/or in the classification document, and which is not (fully) covered by the field of direct application of the classification document.

Extended application is a prediction of the expected fire resistance of fire-resistant metal faced sandwich panels. It may be based on interpolation between or extrapolation from test data. The fundamental consideration shall be that the fire-resistant metal faced sandwich panels after extension would achieve the required fire performance if it were to be tested according to EN 1364-2.

The extended application of test results from metal faced 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 tests. The general rules in EN 15725 shall be followed.

The necessary information for extrapolation of test results shall be assessed during the sampling and testing as specified in prEN 14509-3:2024, 13.5.1.

4.2 Assumptions in the extended application

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

- a) the ceiling is required to provide fire resistance and shall be classified according to EN 13501-2;
- b) the ceiling is assumed to be exposed on one side (either from above or below) to the standardized heating conditions given in the EN 1363-1 fire resistance test specification or to alternative and additional procedures given in the EN 1363-2;
- c) the supporting construction to which the ceiling is fixed does not significantly deflect during the fire exposure period;
- d) 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 from which loadbearing capacity shall be evaluated;
- e) the support structure has at least the same loadbearing capacity, R , of the fire resistance performance as the sandwich panel ceiling regarding insulation and integrity, if the support structure is on the fire exposed side in end use condition;
- f) the self-weight of the facing and core is calculated from the volume and density of the materials;
- g) the calculation of the reduction in the strength properties of steel at elevated temperature shall be in accordance with EN 1993-1-2.

5 Rules for extended applications of the tested product/construction

5.1 General

When performing extended applications for a tested ceiling, changes can occur either in the materials and/or in the construction. Both are dealt with in this document. Table 1 and Table 2 list the changes which may or may not be made in an extended application assessment. The rules for the changes are either given in Table 1 or Table 2 or in 5.2 and 5.3.

Table 1 — Material changes relevant to extended application

Parameter	Factors	Factor influence on performance		Rules
		Integrity E	Insulation I	
Changes in metal facings	Chemical composition of coating	influence	no influence ^a	5.2.2.1
	Change of colour	influence	influence	5.2.2.1
	Change between coated and non-coated metal	influence	influence	5.2.2.1
	Sheet thickness	influence	no influence ^a	Allowed up to $\pm 0,2$ mm of tested thickness
	Change from one metal to another	influence	influence	5.2.2.2
	Change in sheet geometry	influence	influence	5.2.2.3
Changes in adhesive	Amount	influence	influence	5.2.3
	Type	influence	no influence ^a	5.2.3
Changes in core material	Type	major influence	major influence	5.2.4
	Change in composition	major influence	major influence	5.2.4.2 to 5.2.4.6

^a It is understood that when a change in a factor can influence the integrity of a joint, there is a possibility that a change in the leakage of hot gases or in joint geometry can also influence the temperature rise near the joint and therefore influence the insulation rating.