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Interested committees:

Title: Draft BS EN 14509-1 Factory-made double skin metal faced insulating sandwich panels. Part 1: Self-supporting applications.

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Full document details: 21/30435940 DC

Introduction

This draft standard is based on national and international discussions. Your comments on this draft are invited and will assist in the preparation of the consequent standard.

For international standards, comments will be reviewed by the relevant UK national committee before sending the consensus UK vote and comments to the international committee, which will then decide appropriate action. If the international standard is approved, it is usual for the text to be published as a British Standard.

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Submission of Comments

- **Annotated drafts are not acceptable and will be rejected.**
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Template for comments and secretariat observations

Date: xx/xx/20xx	Document: ISO/DIS xxxx
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1	2	(3)	4	5	(6)	7
MB	Clause No./ Subclause No./Annex (e.g. 3.1)	Paragraph/Figure/ Table/Note	Type of comment	Commend (justification for change) by the MB	Proposed change by the MB	Secretariat observations on each comment submitted
	3.1	Definition 1	ed	Definition is ambiguous and needs clarifying.	Amend to read '...so that the mains connector to which no connection...'	
	6.4	Paragraph 2	te	The use of the UV photometer as an alternative cannot be supported as serious problems have been encountered in its use in the UK.	Delete reference to UV photometer.	

English Version

Factory-made double skin metal faced insulating sandwich panels - Part 1: Self-supporting applications

Panneaux sandwichs isolants double peau à parements
métalliques manufacturés - Partie 1 : Applications
autoportantes

Werkmäßig hergestellte Sandwich-Elemente mit
beidseitigen Metalldeckschichten - Teil 1:
Selbsttragende Anwendungen

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 128.

If this draft becomes a European Standard, 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.

This draft European Standard was established by CEN 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.

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COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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European foreword

This document (prEN 14509-1:2021) has been prepared by Technical Committee CEN/TC 128 “Roof covering products for discontinuous laying and products for wall cladding”, the secretariat of which is held by NBN.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 14509:2013 together with prEN 14509-3:2021 and prEN 14509-5:2021.

EN 14509:2013 is completely revised.

This document has been prepared under two standardization requests given to CEN by the European Commission and the European Free Trade Association.

For relationship with Regulation (EU) No.305/2011 on construction products (CPR), see informative Annex ZA, which is an integral part of this document.

Introduction

In FprEN 14509-2:2020, the rules on assessment of performance for structural use are given, as this standard is for use as self-supporting panels.

The clarification of which application is self-supporting is given by national provisions.

In prEN 14509-3:2021, methods for the determination of characteristics given in this document are given.

In EN 14509-4:2020, methods for the determination of fixing performance of panels and restraining effect on substructures are given.

In EN 14509-5:2020, design rules and criteria for combing actions and spans are given.

1 Scope

This document specifies characteristics of factory-made double skin metal faced insulating sandwich panels for use in elements for self-supporting applications in roofs, in external and internal walls (including partitions) and in ceilings in buildings (hereafter sandwich panels).

The sandwich panels consist of two faces and insulating core either by using auto-adhesive bonding technique or by using a separate adhesive layer.

The face materials covered by this document are:

- steel,
- stainless steel,
- aluminium,

NOTE Aluminium covers aluminium alloys.

- copper.

The insulating cores covered by this document are:

- rigid polyurethane (PU) (see 3.1.15);
- expanded polystyrene (EPS) (see 3.1.13);
- extruded polystyrene foam (XPS) (see 3.1.14);
- phenolic foam (PF) (see 3.1.12);
- mineral wool (MW) (see 3.1.11).

For sandwich panels, the coating of faces is either organic and/or metallic coating.

This document specifies procedures for assessment and verification of constancy (AVCP) of performance of characteristics of sandwich panels.

This document does not cover the following:

- sandwich panels consisting of two or more clearly defined layers of different insulating cores (multi-layered);
- sandwich panels consisting of more than one metal sheet per face;
- curved sandwich panels;
- sandwich panels with perforated faces;
- fasteners and fixings;
- sandwich panels, placed on the market as a part of clean room kits, conditioning room kits, cold storage room kits and cold storage building envelope and building kits.

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 485-2:2016+A1:2018, *Aluminium and aluminium alloys — Sheet, strip and plate — Part 2: Mechanical properties*

EN 485-4:1993, *Aluminium and aluminium alloys — Sheet, strip and plate — Part 4: Tolerances on shape and dimensions for cold-rolled products*

EN 1172:2011, *Copper and copper alloys — Sheet and strip for building purposes*

EN 1396:2015, *Aluminium and aluminium alloys — Coil coated sheet and strip for general applications — Specifications*

EN 10088-1:2014, *Stainless steels — Part 1: List of stainless steels*

EN 10143:2006, *Continuously hot-dip coated steel sheet and strip — Tolerances on dimensions and shape*

EN 10346:2015, *Continuously hot-dip coated steel flat products for cold forming — Technical delivery conditions*

EN 13165:2012+A2:2016, *Thermal insulation products for buildings — Factory made rigid polyurethane foam (PU) products — Specification*

EN 13501-1:2018, *Fire classification of construction products and building elements — Part 1: Classification using data from reaction to fire tests*

EN 13501-2:2016, *Fire classification of construction products and building elements — Part 2: Classification using data from fire resistance tests, excluding ventilation services*

EN 13501-5:2016, *Fire classification of construction products and building elements — Part 5: Classification using data from external fire exposure to roofs tests*

prEN 14509-3:2021, *Factory made double skin metal faced insulating sandwich panels — Part 3: Test methods for determining mechanical strength, building physical behaviour and durability*

EN 15254-5:2018, *Extended application of results from fire resistance tests — Non-loadbearing walls — Part 5: Metal sandwich panel construction*

EN 15254-7:2018, *Extended application of results from fire resistance tests — Non-loadbearing ceilings — Part 7: Metal sandwich panel construction*

EN ISO 6892-1:2019, *Metallic materials — Tensile testing — Part 1: Method of test at room temperature (ISO 6892-1:2019)*

EN ISO 9445 (all parts:2010, *Continuously cold-rolled stainless steel — Tolerances on dimensions and form (ISO 9445)*

CEN/TS 1187:2012, *Test methods for external fire exposure to roofs*

3 Terms, definitions, symbols, subscripts and abbreviations

3.1 Terms and definitions

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

3.1.1

auto-adhesion

self-adhesion of the core to the face(s) occurring automatically without the use of an adhesive

Note 1 to entry: This technique is used by producing panels by foaming.

3.1.2

bond

adhesion between the face(s) and the core

3.1.3

core

layer of material, having insulating properties, which is bonded between two metal faces

Note 1 to entry: Panels with special edge details in the longitudinal joints may utilize different core materials from the main insulating core (e.g. for improved fire performance) if these edge details have no influence on the mechanical performance of the panel.

3.1.4

edge

side of the panel where adjacent panels join together in the same plane

3.1.5

face

flat, lightly profiled or profiled thin metal sheet bonded to the core

3.1.6

flat face

face without any rolled or pressed profile, or raised strengthening rib

3.1.7

incompletely bonded face

metal face whose bond to the core is adequate for sandwich action but does not include the entire surface of the core

Note 1 to entry: An example is a trapezoidally profiled face that has voids between the raised profiles and the core.

3.1.8

incompletely bonded panel

panel in which one or both faces are incompletely bonded

3.1.9

joint

interface between two panels where the meeting edges have been designed to allow the panels to join together in the same plane

Note 1 to entry: The joint may incorporate interlocking parts that enhance the mechanical properties of the system as well as improving the thermal, acoustic and fire performance and restrict air movement.

Note 2 to entry: The term 'joint' does not refer to a junction between cut panels or a junction where the panels are not installed in the same plane.

3.1.10

lamella

core material consisting of mineral wool that has been cut and orientated with the fibres perpendicular to the faces prior to bonding

3.1.11

lightly profiled face

face with a rolled or pressed profile not exceeding 5 mm in depth

3.1.12

mineral wool (MW)

insulating wool produced from molten stone, slag or glass

[SOURCE: EN 13162:2012+A1:2015]

3.1.13

phenolic foam (PF)

insulating foam produced from PF

[SOURCE: EN 13166:2012+A2:2016]

3.1.14

expanded polystyrene (EPS)

insulating foam produced from EPS

[SOURCE: EN 13163:2012+A2:2016]

3.1.15

extruded polystyrene foam (XPS)

insulating foam produced from XPS

[SOURCE: EN 13164:2012+A1:2015]

3.1.16

polyurethane (PU)

insulating rigid foam produced from PUR or PIR

[SOURCE: EN 13165:2012+A2:2016]

3.1.17

pre-manufactured

component or material that is supplied to the manufacturer ready for direct incorporation into the sandwich panel

3.1.18

shift

period of production during a working day, normally 6 h to 8 h but can be less

3.1.19

wrinkling strength

strength representing the characteristic value of wrinkling stress at the moment of failure load

3.2 Symbols, subscripts and abbreviations

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

3.2.1 Symbols

D	overall thickness of the panel
E	modulus of elasticity
G	shear modulus
L	length of span, length of measurement
R	sound reduction index (R_w), strength, load bearing capacity
T	temperature
U	thermal transmittance
b	width of rib and valley in metal face profile
d	depth, continuous depth of core d_c , depth of stiffener d_s
f	strength
h	depth of metal face profile
k	stress distribution factor over support, relation between strength after ageing and initial strength
m	mass
t	thickness of face sheet
w	cover width
x, y, z	coordinates
α	sound absorption (α_w),
λ	thermal conductivity, λ_{Design} (design value),
φ	creep coefficient
σ	wrinkling strength

3.2.2 Subscripts

C	core
D	expressed thermal conductivity (λ_D)
c	compression,
d	design, expressed thermal transmittance including the influence of the joints $U_{d,S}$
k	characteristic