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Thermal insulation products — Exterior insulation and finish systems (EIFS) —

Part 3: Design requirements

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ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 163, *Thermal performance and energy use in the built environment*, Subcommittee SC 3, *Thermal insulation products*.

A list of all parts in the ISO 17738 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Introduction

This document provides specifications for architects, design professionals and builders on the integration of an exterior insulation and finish system (EIFS) into their projects.

This document is predicated on the selected EIFS assembly being in compliance with the requirements of ISO 17738-1, and system installation in compliance with ISO 17738-2.

The design criteria in this document are based on the principle that the building envelope contains five 'planes-of-control':

— water-shedding barrier;

— water-resistive barrier;

— thermal barrier;

— air barrier;

— vapour barrier.

Each plane-of-control corresponds to an individual function that the cladding assembly is designed to perform. The function of the planes-of-control are:

— Water-shedding barrier: This is designed to deflect rainwater away from the wall surface, thereby minimizing water penetration into the cladding assembly.

— Water resistive barrier: Accepting that some water could find its way behind the cladding, a continuous water resistive barrier is required to protect the substrate. Water that penetrates one cladding component should not be directed to drain behind another. Any water that reaches the water resistive barrier should have a clear drainage path to the exterior of the cladding.

— Continuous thermal barrier: The principle benefit of an EIFS cladding is the continuous thermal barrier installed on the exterior of the structure. Insulation should be adequate to prevent condensation within the wall assembly while meeting requirements for energy use. The designer should detail the thermal barrier to minimize thermal bridging, using ISO 14683 as a guide.

— Air barrier system: Effective thermal and moisture control requires a continuous air barrier system on all faces of the building envelope. With an EIFS, the air barrier function is provided by the water resistive barrier. Details should show connections with other airtight elements and materials within the building envelope.

— Vapour barrier: Where required by environmental conditions, a vapour barrier, may be a component of the EIFS. The vapour barrier might, for example be a vapour-impermeable water resistive barrier or another material in the wall assembly (e.g. polyethylene sheet). The function of the vapour barrier is to minimize water vapour penetrating through materials comprising the wall assembly then condensing on a cold surface where it has limited ability to drain or dry.

This document addresses the minimum number of locations in the wall assembly where the creation of architectural details is essential. When creating EIFS details for a project, the designer should be mindful of how the five planes-of-control within the building envelope are integrated across the various architectural components (e.g. the air barrier of a window functions as a hermetic part of the air barrier system when structurally sealed to the air barrier of the wall).

An important aspect of developing details is to specify materials that meet the function of each plane-of-control. The detail then illustrates how the control planes are connected. A series of illustrations showing sequence of installation and connection could be necessary. Each detail should clearly illustrate how a plane-of-control is integrated with the adjacent element to provide a continuous layer within the building envelope.

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Thermal insulation products — Exterior insulation and finish systems (EIFS) —

Part 3: Design requirements

WARNING — The use of this document can involve hazardous materials, operations and equipment. It does not purport to address all the health and safety considerations associated with its use.

1 Scope

This document specifies the design requirements, selection and application of exterior insulation and finish systems (EIFS) for use by building designers, building code officials, product manufacturers and contractors in order to sustain the installed performance and durability of EIFS.

NOTE This document does not address all aspects related to EIFS design, selection and use. A working knowledge of applicable regional building codes and regulations is helpful when working with this document. There could be other considerations for specific installations that are not addressed by this document.

This document contains design requirements for the design and installation of an EIFS as a wall cladding system. The document includes selection of materials that meet the requirements of ISO 17738-1, and installation requirements in accordance with ISO 17738-2 and covers the interfaces between EIFS and other building assemblies and components.

This document refers to adhesively fastened systems, although mechanical fastening could be required in specific circumstances (refer to Annex A). For information on EIFS resiliency, refer to Annex B.

This document does not specify the structural design of the substrate to which the EIFS is attached, nor does it provide design requirements when the installation of EIFS uses mechanical fasteners.

This document is applicable to new and retrofit EIFS installations.

2 Normative reference

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.

ISO 7345, *Thermal performance of buildings and building components — Physical quantities and definitions*

ISO 9229, *Thermal Insulation — Vocabulary*

ISO 17738-1, *Thermal insulation products — Exterior insulation and finish systems — Part 1: Materials and systems*

ISO/ 17738-2, *Thermal insulation products — Exterior insulation and finish systems (EIFS) — Part 2: Installation*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 7345, ISO 9229, ISO 17738-1, ISO 17738-2 and the following apply.

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

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1
environmental separator
above grade wall separating the interior and exterior environments

4 Materials

All of the EIFS specified for a project shall be tested for compliance with the requirements of ISO 17738-1. There shall be no alterations or substitution of the EIFS materials to be used in the EIFS assembly.

5 Design criteria

This document contains requirements for the design of exterior insulation and finish systems (EIFS) as a wall cladding system. Provisions for the functional aspects of the water shedding barrier, water resistive barrier, thermal control layer, resistance-to-air-movement and vapour movement are covered as functions of a wall assembly.

6 Design requirements

As a minimum, project design drawings, details, and specifications shall clearly indicate details of interfaces and joints, including flashings, required to maintain continuity of the water shedding barrier (lamina), the water resistive barrier assembly (WRBA), air barrier assembly and the vapour barrier assemblies at the following building locations:

a) foundation walls;

b) window and door sills;

c) window and door heads;

d) window and door jambs;

e) adjacent dissimilar cladding systems;

f) building envelope penetrations, such as exhaust boxes, signs, guard anchors or mechanical equipment;

g) joints intended to drain water;

h) intersecting balustrades;

i) roof-to-wall interfaces;

j) above roofing (penthouses and return walls);

k) roof parapets and overhangs; and

l) balconies.

The minimum thickness of thermal insulation board shall be 50 mm. Exceptionally, a minimum thickness of 30 mm of thermal insulation board shall be permitted behind an aesthetic reveal as measured from the base of the reveal and the deepest point of the geometrically-defined drainage cavity (GDDC) pattern.

Project specifications shall stipulate that EIFS is installed in accordance with ISO 17738-2.

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