INTERNATIONAL STANDARD

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Reaction-to-fire tests for façades —

Part 2: Large-scale test

Essais de réaction au feu des façades —

Partie 2: Essai à grande échelle

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this part of ISO 13785 may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 13785-2 was prepared by Technical Committee ISO/TC 92, *Fire safety*, Subcommittee SC 1, *Fire initiation and growth*.

ISO 13785 consists of the following parts, under the general title *Reaction-to-fire tests for façades*:

— *Part 1: Intermediate-scale test*

— *Part 2: Large-scale test*

Annex A forms a normative part of this part of ISO 13785. Annex B is for information only.

Introduction

Fire is a complex phenomenon. Its behaviour and effects depend on a number of interrelated factors. The behaviour of materials and products depends on the characteristics of the fire, the method of use of the materials and the environment in which they are exposed. The theory of “reaction to fire tests” is explained in [2].

The need for improved thermal insulation of buildings, both for single- and multi-storey dwellings and for industrial buildings, has led to an increased use of insulated and often ventilated façades.

In their end use, façade assemblies can potentially be subjected to three primary fire exposure scenarios. These are:

a) an interior compartment fire venting through a window on to a façade;

b) an exterior fire in combustibles accumulated near a wall (e.g. rubbish, vegetation, bush fires);

c) radiant exposure from fire in an adjacent building.

This part of ISO 13785 only covers items a) and b). Item c) is typically regulated by spatial separation and allowable openings in the building codes.

The test specified in this part of ISO 13785 is for a post-flashover fire scenario within a building compartment venting through a window opening and impinging directly on to a façade. The window fire exposure may also simulate a fire from combustibles accumulated near a wall. The results may not, however, reflect the actual performance of exterior wall assemblies under all fire exposure conditions.

Fire on a façade can spread in several ways, with the most significant over a combustible exterior surface. Fire can also travel vertically and horizontally through air cavities within cladding or façade components or through an insulation core. Experience from real fire accidents, and also laboratory studies worldwide on configurations with and without internal corners, show that the worst-case situation is with an internal corner. This part of ISO 13785 therefore includes an internal corner.

Fire incidents show that fire can spread along an exterior façade from the level of fire origin to the level above, regardless of the contribution from façade components. This test method therefore is intended to determine the contribution from the façade components to upward fire spread, beyond the floor immediately above the level of fire origin (i.e. the contribution from façade components for fire to spread from the level of fire origin to two levels above, also called leap-frogging).

The two parts of ISO 13785 provide two methods of test: an intermediate-scale test specified in Part 1 which should only be used for screening or for evaluation of subcomponents or “families of products”, and the large scale test specified in this part, which should be used to provide an end-use evaluation of all aspects of the façade system. A direct correspondence between the intermediate-scale test, specified in Part 1, and the full-scale test specified in this part, should not be assumed. The purpose of Part 1 is only to reduce the burden of testing in Part 2 by eliminating systems which fail Part 1.

The test specified in this part of ISO 13785 is intended to evaluate external wall or facing materials and constructions of façades which are not suitable for assessment using ISO 9705[3], which evaluates the fire growth from a surface product intended to be used for internal wall and ceiling linings.

The test specified in this part of ISO 13785 does not rely on the use of asbestos-based materials.

Reaction-to-fire tests for façades —

Part 2:
Large-scale test

WARNING — So that suitable precautions may be taken to safeguard health, all persons involved in the fire tests should be aware of the possibility that toxic or harmful gases may be evolved during exposure of test specimens.

Hazards are encountered when assessing the fire performance of any product on a large scale and it is essential that adequate precautions be taken.

Particular attention should be paid to the potential evolution of smoke and toxic gases and to the fact that extensive flaming of specimens can occur sometimes, resulting in mechanical failure of fixings and joints and possible structural collapse.

An adequate means of extinguishing the specimen should be provided.

1 Scope

This part of ISO 13785 specifies a method of test for determining the reaction to fire of materials and construction of façade claddings when exposed to heat and flames from a simulated interior compartment fire with flames emerging through a window opening and impinging directly on the façade. The information generated from this test may also be applicable to the scenario of an external fire impinging on a façade; however, the results may not be applicable for all fire exposure conditions.

This method is applicable only to façades and claddings that are non-loadbearing. No attempt is made to determine the structural strength of the façade or cladding.

This test is not intended to determine the fire behaviour of a given building façade. Details such as balconies, windows, window shutters, curtains, etc., are not considered in this test. This test does not include the risk of fire spread, for example through the window details of the façade system, as it only is constructed as a façade wall. There is clear evidence that an internal corner (also called a re-entrant corner) configuration produces a more intense fire exposure than a flat façade. The most commonly encountered internal re-entrant corner is with an angle of 90°. The test façade specimen therefore contains an internal corner with a re-entrant angle of 90°.

The test method described is intended to evaluate the inclusion of combustible components within façades and claddings of buildings which are otherwise of non-combustible construction.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of ISO 13785. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of ISO 13785 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 13943:2000, *Fire safety — Vocabulary*

IEC 60584-2, *Thermocouples — Part 2: Tolerances*