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Penjeni polimerni materiali - Brizgana poliuretanska pena za toplotno izolacijo - 3. del: Preskusne metode

Rigid cellular plastics - Spray-applied polyurethane foam for thermal insulation - Part 3: Test methods

Plastiques alvéolaires rigides - Mousse de polyuréthanne projetée pour l'isolation thermique - Partie 3: Méthodes d'essai

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INTERNATIONAL STANDARD

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Rigid cellular plastics — Spray-applied polyurethane foam for thermal insulation —

Part 3: Test methods

Plastiques alvéolaires rigides — Mousse de polyuréthanne projetée pour l'isolation thermique — Partie 3: Méthodes d'essai

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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 2.

The main task of technical committees is to prepare International Standards. 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 document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 8873-3 was prepared by Technical Committee ISO/TC 61, *Plastics*, Subcommittee SC 10, *Cellular plastics*.

This first edition of ISO 8873-3, together with ISO 8873-1 and ISO 8873-2, cancels and replaces ISO 8873:1987, which has been technically revised.

ISO 8873 consists of the following parts, under the general title *Rigid cellular plastics — Spray-applied polyurethane foam for thermal insulation*:

— *Part 1: Material specifications*

— *Part 2: Application*

— *Part 3: Test methods*

Introduction

This part of ISO 8873 provides the test methods required for the specification given in ISO 8873-1. These test methods are currently not stand-alone test standards. In the future, when these test methods become stand-alone International Standards, this part of ISO 8873 will be withdrawn.

Rigid cellular plastics — Spray-applied polyurethane foam for thermal insulation

Part 3:
Test methods

WARNING — Persons using this document should be familiar with normal laboratory practice, if applicable. This document does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user to establish appropriate safety and health practices and to ensure compliance with any regulatory requirements.

1 Scope

This part of ISO 8873 specifies the test procedures that are to be used when testing spray-applied polyurethane foam materials to verify that they meet the requirements given in ISO 8873-1.

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 amendments) applies.

ISO 8873-1, *Rigid cellular plastics — Spray-applied polyurethane foam for thermal insulation — Part 1: Material specifications*

3 Terms and definitions

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

3.1
air-exchange rate
AER
volume of clean air brought into the chamber in 1 h divided by the chamber volume measured in identical volume units

NOTE This rate is normally expressed in air changes per hour (AC/h).

3.2
air permeance
rate of airflow (l/s), per unit area (m^2) and per unit static pressure differential (Pa)

3.3
chamber-loading ratio
total exposed surface area of each cellular plastic product specimen divided by the test chamber volume

NOTE Since the cellular plastic product is intended to be installed in large continuous areas, only the face of the insulation is exposed in the test procedure.

3.4
clean air
air that does not contain any volatile organic compounds at a concentration in excess of the allowable background level (i.e. 1 % of the permissible indoor air concentration limit for each compound identified)

3.5
dynamic chamber
chamber where a material specimen can be placed and tested to determine the volatile organic compound emission rate under controlled environmental conditions

3.6
GC/MS-SCAN
gas chromatograph/mass spectrometer operated in scan mode

3.7
head-space analysis
procedure for measuring the volatile organic compounds (VOCs) present in the air space enclosed within a static, airtight chamber

NOTE The chamber is assumed to contain VOCs in equilibrium with the VOCs emitted by the specimen in the chamber.

3.8
head-space (static) chamber
airtight chamber where a specimen can be placed and tested to determine the volatile organic compounds emitted under controlled environmental conditions

3.9
internal standard
volatile organic compound (other than that identified in the head-space analysis) which is injected at a known rate into the dynamic chamber in order to verify sample collection and analysis procedures

3.10
permissible indoor air concentration
maximum allowable indoor air concentration of a volatile organic compound

3.11
tracer gas
gaseous chemical (e.g. SF_6 and N_2O) used to study the mixing characteristics of the dynamic chamber and to provide a crosscheck of the air-exchange rate measurements

3.12
threshold limit value
TLV®
time-weighted average concentration for a normal 8 h workday and a 40 h workweek, which nearly all workers may be repeatedly exposed to without adverse effects, day after day

NOTE Also called TLV-TWA (threshold limit value–time-weighted average).

3.13
volatile organic compound
VOC
organic compound with a saturation vapour pressure at room temperature and/or with a boiling point less than 260 °C

4 Standard laboratory procedure for the determination of volatile organic compound emissions from cellular plastic products

4.1 General

This standard laboratory procedure has been developed for the assessment of volatile organic compound emissions from building materials made from plastic.

It specifies recommended procedures for the use of test chambers to evaluate emissions from a product at a point in time following its installation. It contains the following:

a) a head-space analysis procedure for initial identification of volatile organic compounds released by a material;

b) two dynamic chamber procedures (A and B) for characterizing the rate of volatile organic compound emissions from a material;

c) methodology for calculating the estimated indoor air concentrations of volatile organic compounds based on the results of dynamic chamber testing.

The headspace analysis is a static test to identify significant amounts of emitted compounds from the material. It is followed by either dynamic chamber procedure (A or B).

Procedure A determines the long-term VOC emission characteristics of the material. The test is conducted after conditioning the material sample for 30 days.

Procedure B determines the VOC emission profile of the product commencing 20 h to 24 h after installation of the material in a building and continues for 30 days.

The results of procedure A or B are used to calculate the indoor air VOC concentration profiles and to determine the acceptability of the material for new construction and/or retrofit use.

Procedure A is used to evaluate the material in new residential construction when there is a minimum of 30 days from material installation to building occupancy.

Procedure B is a more complex evaluation of the material when the normal 30-day minimum airing-out period associated with new construction is not provided (e.g. occupied buildings).

In these special cases (e.g. occupied buildings), the product and/or application standard will provide the requirements for isolation and ventilation, if necessary. The test results of procedure B will determine the length of time that these requirements are necessary.

The methodology for assessing the acceptability of the material utilizes a comparison of the estimated indoor air concentration of volatile organic compounds (VOCs) with permissible concentrations.

4.2 Apparatus and equipment

4.2.1 General product requirements

All equipment and apparatus in contact with the specimen or the associated air stream, including the air-exchange system, chambers, sample holder and air sampling system, shall be of glass, stainless steel or another inert material. Special care should be taken to ensure that gaskets, seals, sealants, valve and pump components and other associated items are chemically inert.

4.2.2 Head-space (static) chamber

The head-space chamber shall be a small container (approximately 1 litre) and shall be constructed of materials that meet the requirements of 4.2.1. The interior should be smooth and easy to clean. The container