INTERNATIONAL STANDARD

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Thermal insulation products — Conformity control systems —

Part 2: *In-situ* products

Produits isolants thermiques — Systèmes de contrôle de la conformité —

Partie 2: Produits fabriqués sur place

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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 12576-2 was prepared by Technical Committee ISO/TC 163, *Thermal performance and energy use in the built environment*, Subcommittee SC 3, *Thermal insulation products*.

ISO 12576 consists of the following parts, under the general title *Thermal insulation products — Conformity control systems*:

— *Part 1: Factory-made products*

— *Part 2:* In-situ *products*

Thermal insulation products — Conformity control systems —

Part 2: *In-situ* products

1 Scope

This part of ISO 12576 establishes three systems for the conformity control of thermal insulation products that are manufactured on site from components produced in a factory, and provides the minimum requirements for each system. Examples of these types of products are loose fill and spray-applied insulations.

The purpose of this part of ISO 12576 is to provide uniform methods to determine whether the production of a thermal insulation product is acceptable as conforming to the relevant specification requirements once it is installed on site.

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/IEC Guide 65, *General requirements for bodies operating product certification systems*

ISO 9229, *Thermal insulation — Vocabulary*

ISO 12576-1, *Thermal insulation — Insulating materials and products for buildings — Conformity control systems — Part 1: Factory-made products*

ISO 17020, *General criteria for the operation of various types of bodies performing inspection*

ISO 17021, *Conformity assessment — Requirements for bodies providing audit and certification of management systems*

ISO 17024, *Conformity assessment — General requirements for bodies operating certification of persons*

ISO 17025, *General requirements for the competence of testing and calibration laboratories*

ISO 17050-1, *Conformity assessment — Supplier's declaration of conformity — Part 1: General requirements*

3 Terms and definitions

For the purpose of this document, the terms and definitions given in ISO 9229 and the following apply.

3.1
certification organization
organization that conducts certification of conformity and is accredited by an appropriate body, possessing the necessary competence and reliability to operate a certification system in accordance with International Standards in which the interests of all parties concerned with the functioning of the system are represented

NOTE A certification organization may operate its own testing and inspection activities or oversee these activities carried out on its behalf by other bodies.

3.2
conformity control
performance of control methods to prove whether a product can be accepted as conforming to specified requirements

3.3
inspection lot
definite quantity of packages (product items) manufactured under conditions that are presumed uniform, and that are submitted for inspection and accepted or rejected as a whole, depending on the quality found by inspection of a representative sample drawn from the lot

3.4
manufacturer's declaration of conformity
action by which a manufacturer declares under his own responsibility, by means of a “declaration of conformity” that the product is in conformity with the specification, without being under procedures of a third-party certification system

See ISO 17050-1.

3.5
qualified contractor
individual, organization or corporation who/that has the knowledge required for installing the material, who/that is responsible for the installation of the material and who/that has the contractual obligations for the installation

3.6
qualified installer
individual who has proper knowledge of the installation requirements and who installs the material on site to form the final product

3.7
specification
document defining requirements for performance of the product

3.8
third party
person or body that is recognized as being independent of the parties involved with respect to the issues in question

3.9
third-party certification
certification provided by a person or body that is recognized as being independent of the parties involved the certification

See ISO 17000.

3.10
verification
validation by a third party, independent of the manufacturer, of the manufacturer's declaration of conformity

4 Conformity systems, their elements and recommended application of the systems

4.1 General

In this specification, the following three systems for attestation of conformity are described:

— system A: qualified contractor's self-declaration of conformity in accordance with ISO 17050-1, based on the installer's documented installation procedures and internal quality control and initial type testing of the product by the manufacturer, without any participation of a third party to the ongoing surveillance of factory production or site installation;

— system B: qualified contractor's declaration of conformity, based on the installer's documented installation procedures and internal quality control and initial type testing of the components by a laboratory accredited in accordance with ISO 17025, where both the manufacturer's quality control and the installer's quality control has been certified initially by a third party; there is ongoing surveillance for the factory production control but not for the site installation;

— system C: installed product certification by a certification organization in accordance with ISO 17021 and ISO/IEC Guide 65, based on the installer's documented installation procedures and internal quality control and initial type testing of the components by a laboratory accredited in accordance with ISO 17025, where both the manufacturer's quality control and the installer's quality control has been certified initially by a third party; the certification organization certifies the installer in accordance with ISO 17024 and ongoing surveillance site audits are conducted on a regular basis by the certification organization accredited in accordance with ISO 17020.

NOTE Systems B and C have a progressive increase in third-party involvement in the conformity control system.

4.2 System A — Declaration of conformity by a qualified contractor — Initial type testing of manufacturer's product, manufacturer's internal quality control and qualified contractor's internal site quality control

This system is based on the following elements:

a) manufacturer's responsibilities:

   — factory production control;

   — having initial type testing of the components completed by the manufacturer;

b) qualified contractor's responsibilities:

   — self-declaration of conformity following requirements outlined in ISO 17050-1;

   — document site quality-control programme;

c) qualified installer's responsibilities:

   — documented installation procedures;

   — ongoing site inspection and testing by the installer;

   — daily work records by the installer;

d) certification organization:

   — none.

By the qualified contractor's declaration of conformity, the contractor verifies that the installation is under a site quality-control program and that the results of the site quality-control program show that the installed products are in conformity with the product specification and any applicable installation standards.

4.3 System B — Declaration of conformity by an installer — Initial type testing of manufacturer's product by a third party, third-party verification of factory production control, verification of a qualified contractor's site quality-control program and site quality control by a qualified contractor

This system is based on the following elements:

a) manufacturer's responsibilities:

- factory production control;
- having initial type testing of the components completed by a laboratory accredited in accordance with ISO 17025;

b) qualified contractor's responsibilities:

- document site quality-control program;

c) qualified installer's responsibilities:

- documented installation procedures;
- ongoing site inspection and testing by the installer;
- daily work records by the installer;

d) certification organization, in accordance with ISO 17021 and ISO/IEC Guide 65:

- testing laboratory accredited in accordance with ISO 17025;
- initial inspection of factory production control;
- ongoing surveillance audits of factory production control;
- initial inspection of the qualified contractor's installation procedures, site quality-control program, installer's site inspection, installer's site testing procedures and daily work record.

By the qualified contractor's declaration of conformity, the qualified contractor verifies that the installation is under a site quality-control program that has been verified by a third party and that the results of the site quality-control program show that the installed product is in conformity with the product specification and any installation standards. The qualified contractor also declares that the factory production control has been verified and is being monitored by a certification organization. Certification bodies shall be in accordance with ISO 17021 and be accredited by an accreditation body that is member of the IAF/ILAC Multilateral Agreement.

4.4 System C — Declaration of conformity by a third party — Initial type testing of manufacturer's product by a third party, third-party verification of factory production control, verification of a qualified contractor's site quality-control program and site quality control by a third party

This system is based on the following elements:

a) manufacturer's responsibilities:

- factory production control;
- initial type testing of the components completed by a laboratory accredited in accordance with ISO 17025;

b) qualified contractor's responsibilities:

- document site quality-control program;

c) qualified installer's responsibilities:

- documented installation procedures;
- ongoing site inspection and testing by the installer;
- daily work records by the installer;

d) certification organization, in accordance ISO 17021 and ISO/IEC Guide 65:

- testing laboratory accredited in accordance with ISO 17025;
- initial inspection of factory production control;
- ongoing surveillance audits of factory production control;
- initial inspection of the qualified contractor's installation procedures, site quality-control program, installer's site inspection, installer's site testing procedures and daily work record;
- development of a certification scheme in accordance with ISO 17024;
- routine certified installer audits to provide surveillance, assessment and approval of the ongoing *in-situ* product installation (routine inspections) in accordance with ISO 17020.

By the certification organization's declaration of conformity, the certification organization verifies that the installation is under a site quality-control program that has been verified and is monitored on an ongoing basis by a third party and that the results of the site quality-control program show that the installed products are in conformity with the product specification and any installation standards. Certification bodies shall be in conformance with ISO 17021 and be accredited by an accreditation body that is member of the IAF/ILAC Multilateral Agreement. The certification organization also declares that the factory production control has been verified and is being monitored. The certification organization for the factory production control may be a different organization from the certification organization for the site quality-assurance program; however, the certification organization for the site quality-assurance program shall be consistent with that for the factory production control program.

5 Factory production control

The purpose of the control is to ensure the products produced conform to the material specification. Factory production control requirements shall be in accordance with ISO 12576-1. The manufacturer shall choose and document which system in accordance with ISO 12576-1 is being followed. The manufacturer shall meet the factory-production-control and certification-organization-monitoring outline in any one of the three systems. For material that takes its final form on a construction site, this part of ISO 12576 specifies the requirements to ensure that the products produced conform to the material specification.

6 Site installation control

6.1 General

The purpose of the site installation quality control is to ensure that the *in-situ* products conform to the product specification and that they have been installed in accordance with the appropriate installation standard(s) and in accordance with the product manufacturer's instructions. Site installation quality control, as defined in Clause 6, is the most important element of each of the three systems defined in ISO 12576-1 for the attestation of conformity.

Site installation quality control includes the operational techniques and measures necessary to maintain and regulate the quality of the installed product. It consists of continuous process monitoring, inspections and tests by the installer and the utilization of their results with regard to equipment settings, products used, processes of installation, and the installed product itself, and by taking account of the corresponding requirements given by the product specification.

All equipment and personnel required to carry out the necessary inspections and tests indicated in Clause 6 shall be available.

6.2 Site quality control manual

For each *in-situ* product, the qualified contractor shall provide a documented site quality-control system (quality manual), which shall deal with the following elements of the installer's quality system:

a) duties, responsibility and authority of the installation personnel;

b) inspection methods, testing methods and procedures in general, including a complaint-handling procedure, and their documentation;

c) testing equipment and its calibration;

d) quality control of product and constituents, batch identification and control;

e) nature, extent and frequency of tests on the product;

f) daily work records;

g) handling of rejected installations;

h) procedures for correction of non-conforming installation;

i) internal documentation, including test records, installation records, product declarations, etc.

6.3 Nature, extent and frequency of inspections and tests

The nature, extent and frequency of inspections and tests depend on the kind of product being installed, the basic materials, and the specific conditions of the installation sites.

The minimum frequency of inspections and tests to be performed by the installer who produces thermal insulation products *in-situ* are stated in the following three tables.

The minimum frequency of tests for control of the finished thermal insulation product on site shall be as specified in Table 1, unless otherwise specified in the product specification.

For systems A and B, all controls on the product and the installation process shall be agreed between the manufacturer and the contractor. For system C, all controls on the installed product and the installation process shall be agreed between the manufacturer, the contractor, the installer and the certification organization according to the general principles given below. These principles shall be considered as basic information about the condition of the installation.

Table 1 — Control of installed product for each site

Group	Measured property	Purpose	Minimum frequency	Additional testing
Group 1 Polyurethane foam (spray or pouring)	Thickness	To ensure that the required thickness has been met	Ongoing during spraying	Check four 1 m by 1 m areas at random at the end of the day to confirm compliance with thickness requirements.
	Density	To ensure that the minimum density that has been declared by the manufacturer has been met	Once per day (approximately 1 h after start-up)	In case of dispute, check the density in a laboratory.
	Adhesion/cohesion	To ensure proper adhesion to the substrate	Once per day (approximately 1 h after start-up)	Additional adhesion/cohesion tests are required when the substrate changes.
	Temperature (ambient and substrate)	To ensure that the installation is being done within the range declared by the manufacturer	Once per day (approximately 1 h after start-up)	Additional temperature readings tests are required when the substrate or environmental conditions change.
	Dimensional stability	To ensure that the installed product performs as intended	In case of dispute	Check the dimensional stability in a laboratory.
Group 2 Fibres that are changed when installed (e.g. cellulose fibre)	Thickness	To ensure that the required thickness has been met	Ongoing during installation	Check four areas at random at the end of the day to confirm compliance with thickness requirements.
	Mass per unit area	To ensure that the correct amount of material has been installed as declared by the manufacturer	Once per day (approximately 1 h after start-up)	In case of dispute, check four areas at random.
Group 3 Loose fill that does not change when installed (e.g. perlite)	Thickness	To ensure that the required thickness has been met	Ongoing during installation	Check four areas at random at the end of the day to confirm compliance with thickness requirements.
	Mass per unit area	To ensure that the correct amount of material has been installed as declared by the manufacturer	Once per day (approximately 1 h after start-up)	In case of dispute, check four areas at random.

6.4 Testing

Testing shall be done on site by the qualified installer. The testing, unless otherwise specified in the relevant product specification, shall be performed according to this part of ISO 12576.

6.5 Qualified installer's daily work records

The qualified installer shall record the results of site quality control on daily work records. The daily work record shall contain a description of the product, the date of installation, the test methods used, results of the tests and the identification of the installer.

Where the product inspected does not satisfy, or if there is an indication that they do not satisfy, the requirements as to the quality laid down in the product specification, or if there is an indication that they do not do so, the corrective action taken shall be recorded on the installer's daily work record (e.g. carrying-out of a new inspection and/or measures to correct the installation process).

The qualified contractor shall keep the daily work records on file for a minimum of five years.

6.6 Persons responsible for site quality control — Qualified installer

At every installation site where thermal insulation products are installed, the qualified contractor shall appoint a qualified installer who shall have appropriate knowledge and experience of the installation of the products and who shall be responsible for conducting and supervising site quality control procedures and ensuring that the daily work records are duly completed.

6.7 Measures in the event of non-compliance with the requirements

When tests show that the installed product does not meet the requirements declared by the manufacturer, the installer shall take the steps necessary to correct the deficiencies. The non-conforming characteristics of the installed products shall be corrected (i.e. removal and replacement of material, use of additional material) and the action taken shall be reported on the daily work record. When the deficiency has been rectified, the test used to identify the deficiency shall be repeated and shall be recorded as evidence that the defects have been corrected.

7 Certification of factory production control and of site quality control

7.1 General

7.1.1 Factory production control (of components)

7.1.1.1 System A

The manufacturer is responsible for declaring the factory production control of the components and the product type testing and shall have personnel with the necessary competence to perform these tasks. The manufacturer's personnel shall possess the technical competence for testing products.

7.1.1.2 System B

The manufacturer is responsible for declaring the factory production control of the components and the product type testing and shall have personnel with the necessary competence to perform these tasks. The manufacturer's personnel shall possess the technical competence for testing products and certifying products.

The initial product type testing shall be carried out by an independent laboratory accredited in accordance with ISO 17025 by an accreditation body that is member of the IAF/ILAC Multilateral Agreement.

7.1.1.3 System C

The manufacturer is responsible for declaring the factory production control of the components and shall have personnel with the necessary competence to perform these tasks. The manufacturer's personnel shall possess the technical competence for testing products and certifying products.

The certification organization shall be responsible for certifying the factory production control, the product type testing and the ongoing surveillance of the factory production control. The certification organization shall have the necessary competence, impartiality and integrity to perform these tasks. The certification organization shall apply the general criteria and shall have the technical competence for testing and certifying products. The certification organization shall be accredited for this task by an accreditation body that is member of the IAF/ILAC Multilateral Agreement. For product type testing, the testing shall be performed by an independent laboratory accredited in accordance with ISO 17025 by the proper authority and the results submitted to the certification organization for product certification.

7.1.2 Site production control

7.1.2.1 System A

The qualified contractor shall be responsible for the site quality control and for qualifying the installers. The qualified contractor shall have personnel with the necessary competence and integrity to perform these tasks. The personnel shall possess the technical competence for site audits of installers and installed thermal insulation products.

7.1.2.2 System B

The qualified contractor shall be responsible for the site quality control and for qualifying the installers. The qualified contractor shall have personnel with the necessary competence and integrity to perform these tasks. The personnel shall possess the technical competence for site audits of installers and installed thermal insulation products. The qualified contractor shall have the site quality-control program certified by a certification organization.

7.1.2.3 System C

The certification organization shall be responsible for certifying the site quality control, certifying the installers and conducting surveillance audits on the qualified installers. The certification organization shall have the necessary competence, impartiality and integrity to perform these tasks. The certification organization shall apply the general criteria and shall have the technical competence to deliver a site quality-assurance program that includes reviewing the qualified contractor's internal quality-control program, conducting site audits of installers and inspections of installed thermal insulation products. The certification organization shall be accredited in accordance with ISO 17024 for the certification of the installers and accredited in accordance with ISO 17020 for the surveillance audits of the installers. The certification organization shall be accredited for this task by the national authority or another body that is authorized to accredit certification bodies.

7.2 Surveillance and assessment of site quality control

7.2.1 Initial audit — Systems B and C

The initial audit is for the purpose of determining whether the prerequisites, in terms of staff and equipment, for continuous and orderly installation and for the corresponding internal control appear to be suitable.

It is necessary for the auditor from the certification organization to examine the document of the qualified contractor’s upper management that outlines, the organization's policy, the objectives for, and its commitment to, quality, and the site quality-control system.

The auditor shall, among other things, look into the contractor's quality-control manual and shall assess the suitability of its provisions. The auditor shall be convinced of the availability of the technical requirements for

the product (for example the product specification), the scheme of supervision and control, the quality manual and other documents essential to the site inspections unit.

The inspector shall be satisfied with each of the items referred to in this subclause for the qualified contractor to pass this initial audit.

All relevant facts of the initial inspection, especially the quality-control system operated by the qualified contractor and the assessment of the acceptability of the system, shall be documented in a report.

7.2.2 Surveillance audits — System C

The principal objective of a surveillance audit is to check whether the prerequisites for installation and the agreed site quality-control system are maintained or improved.

For this purpose, the report of the initial contractor audit as a statement of the agreed quality-control system shall be used.

As a minimum during a surveillance audit, it is necessary that the test results from the site quality-control be examined to ensure that the required testing has been carried out at the appropriate frequency, and that proper action has been taken, including that for the calibration and maintenance of test equipment.

A label declaring that the installation has met all requirements shall be visible during the audit.

The results of the surveillance audits shall be documented in a record of the audit.

The frequency of the surveillance audits shall be determined by the certification body who shall demonstrate that the criteria are met. They shall not be announced to the installer.

7.2.3 Certificate of site quality control — System C

When a qualified contractor passes the initial audit to the satisfaction of the certification organization, the certification organization issues a certificate to confirm that the qualified contractor meets the requirements of this part of ISO 12576 for site quality control. The certificate shall be confirmed each year after the surveillance audits have been conducted.

7.3 Installation certification — System C

7.3.1 Installed product certification with surveillance and factory production control

Installed product certification is possible only when both the manufacturer and the qualified contractor are operating under system C.

If there is a certification of the factory production control, this shall be incorporated into the site-installed product certification. If the certification organization that performs the factory production control is different from that responsible for the site-installed product certification, close co-operation between the two certification organizations is essential.

The qualified installer shall conduct the site inspections and testing as required by the product specification on a daily basis. This testing and inspection shall be confirmed by a surveillance audit.

7.3.2 Site audit testing and inspection — System C

During the surveillance audit at the discretion of the certification organization, installed product samples from the site may be taken for testing compliance with the product specification.

The certification organization shall determine the appropriate frequency for surveillance audits, taking account of the individual circumstances. In any case, the frequency should not be less than that stated in the relevant table of the product specification.