INTERNATIONAL STANDARD

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Thermal insulation — Insulating materials and products for buildings — Conformity control systems

Part 1: Factory-made products

Isolation thermique — Matériaux et produits d'isolation pour le bâtiment — Systèmes de contrôle de la conformité

Partie 1: Produits fabriqués en usine

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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 12576 may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 12576-1 was prepared by Technical Committee ISO/TC 163, *Thermal insulation*, Subcommittee SC 3, *Insulation products for building applications*.

ISO 12576 consists of the following parts, under the general title *Thermal insulation — Insulating materials and products for buildings — Conformity control systems*

— *Part 1: Factory-made products*

Part 2 (Site-made products) is in course of preparation.

Thermal insulation — Insulating materials and products for buildings — Conformity control systems

Part 1: Factory-made products

1 Scope

This part of ISO 12576 establishes five systems for the conformity control of thermal insulating materials and products for buildings that are factory made.

Its purpose is to provide uniform methods that are used to determine whether a production or a consignment of a thermal insulating material should be accepted as conforming to the relevant specification requirements.

This part of ISO 12576 provides minimum requirements for each of the systems.

Other systems may be additionally applied when agreed upon between the supplier and purchaser.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of ISO 12576. 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 12576 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 2859-1:1999, *Sampling procedures for inspection by attributes — Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection*.

ISO 9001:2000, *Quality management systems — Requirements*.

ISO 9229:1991, *Thermal insulation — Materials, products and systems — Vocabulary*.

ISO 14001:1996, *Environmental management systems — Specification with guidance for use*.

ISO 14004:1996, *Environmental management systems — General guidelines on principles, systems and supporting techniques*.

ISO/IEC Guide 40:1983, *General requirements for the acceptance of certification bodies*.

ISO/IEC 17025:1999, *General requirements for the competence of testing and calibration laboratories*.

3 Terms and definitions

For the purposes of this part of ISO 12576, the terms and definitions given in ISO 9229 and the following apply.

3.1
acceptance testing
tests to be carried out to prove whether a product may be accepted as conforming to specified requirements

3.2
Acceptance Quality Limit
AQL
designated value of percent nonconforming (or nonconformities per 100 units) that will be accepted most of the time by the sampling scheme to be used

NOTE See ISO 2859-1:1999.

3.3
assessment of factory production control
action by an approved body demonstrating that the factory production control is in conformity with the requirements, based on initial inspection of the factory and the factory production control and continuous surveillance of it

3.4
audit test
one or more tests usually performed by, or on behalf of a certification body, to confirm that a product continues to conform to the requirements of a specification and to provide information to assess the effectiveness of the factory production control

3.5
certification body
body that conducts certification

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

[ISO/IEC Guide 2:1996, definition 15.2]

3.6
certification of conformity
action by an approved certification body demonstrating that adequate confidence is provided that a product is in conformity with the relevant product specification

3.7
conformity control
performance of control methods to prove whether a product may be accepted as conforming to specified requirements

3.8
consignment
quantity of packages or boards of the same category delivered at one time

NOTE The consignment may consist of one or more inspection lots or parts of an inspection lot.

3.9
factory production control
permanent internal control of production exercised by the manufacturer or his agent

NOTE Factory production control comprises operational techniques and all measures necessary to maintain and to regulate the quality of the product up to delivery. It consists of inspections and tests and the utilization of their results with regard to equipment, basic materials and constituents, manufacturing processes and the products themselves, and of taking into account the corresponding requirements given by the product specification.

3.10
initial type test
one or more tests performed on a product prior to commencing normal production to prove that the product is capable of conforming to the relevant requirements of a specification

3.11
inspection lot
definite quantity of packages (product items) manufactured under conditions which are presumed uniform, and that are submitted for inspection and accepted or rejected as a whole, depending on the quality found by inspection of the representative samples drawn from the lot

3.12
item
defined quantity of material, on which a set of observations may be made

EXAMPLE A full-size product, board, roll or package.

3.13
lot testing
system under which a lot, represented by a specified number of items of the product, is tested and the result used to judge the measure of conformity with the specification

NOTE The judgement is on the lot and not on the ongoing production as a whole.

3.14
manufacturer's declaration of conformity
action by which a manufacturer declares under his own responsibility that the product is in conformity with the specification, without being under procedures of a third-party certification system

3.15
manufacturer's routine test
test performed by the manufacturer, at specified intervals, to confirm that the product conforms to the relevant requirements of the specification

3.16
production batch
definite quantity of some commodity manufactured or produced under conditions which are presumed uniform

3.17
production line
production unit
set of equipment which produces a product

3.18
sample
one or more items taken from a production batch and intended to provide information on the production batch and possibly to serve as a basis for a decision on the production batch or the process which produced it

3.19
sample size
number of items in the sample

[ISO 2859-1:1999]

3.20
sampling unit
for the purpose of sampling, an item taken from the production batch

3.21
sampling plan
plan, according to which the sample size, frequency of testing, etc. are defined, in order to obtain information and possibly to reach a decision for conformity control purposes

3.22
specification
document defining requirements for performance of the product

3.23
test specimen
single item or part of an item used for a test

3.24
thermal insulation product
thermal insulation material in its finished form including any facing or coatings

3.25
third party
person or body that is recognized as being independent of the parties involved, as concerns the issue in question

[ISO/IEC Guide 2:1996, definition 12.9]

3.26
third-party certification
certification provided by a person or body that is recognized as being independent of the parties involved as concerns the certification

3.27
type test
one or more tests performed to prove that a product is capable of conforming to all relevant requirements of a specification

3.28
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 part of ISO 12576, the following five systems for attestation of conformity are described.

System 1: Manufacturer's declaration of conformity, based on the manufacturer's factory production control, based on ISO 9001:2000, without any participation of a third party.

System 2: Manufacturer's declaration of conformity, based on the manufacturer's factory production control, and based on ISO 9001:2000, where the manufacturer's factory production control is certified by a third party.

System 3: Manufacturer's declaration of conformity, based on the manufacturer's factory production control, and based on ISO 9001:2000, where the manufacturer's factory production control is certified by a third party and initial type testing of the product by a third party.

System 4: Product certification by an independent approved certification body, based on the manufacturer's factory production control, and based on ISO 9001:2000, with surveillance of this and initial and audit testing by the certification body.

System 5: Lot testing by the customer or his representative, if possible based on a production which is under the manufacturer's factory production control, and based on ISO 9001:2000.

NOTE Systems 1 to 4 have a progressive increase in third-party involvement in the conformity control system. System 5 is only applicable for lot inspections.

4.2 System 1 — Manufacturer's declaration of conformity without any participation of a third party

This system is based on the following elements:

a) factory production control;

b) regular testing of factory samples by the manufacturer.

By the manufacturer's declaration of conformity, he verifies that his production is under factory production control (see clause 5) and that the results of the production control show that the delivered products are in conformity with the specifications.

4.3 System 2 — Manufacturer's declaration of conformity, where the manufacturer's production control is certified by a third party

This system is based on the following elements:

a) factory production control;

b) regular testing of factory samples by the manufacturer;

c) initial inspection of the plant and of the factory production by a certification body;

d) surveillance, assessment and approval of the ongoing factory production control by the certification body (routine inspections).

By the manufacturer's declaration of conformity, he verifies that his production is under factory production control (see clause 5), that this is certified and under ongoing surveillance of a certification body, and that the results of the production control show that the delivered products are in conformity with the specification. Certification bodies shall fulfil the criteria of ISO/IEC Guide 40 and be accredited according to national rules, ISO 14001, ISO 14004 and ISO/IEC 17025.

4.4 System 3 — Manufacturer's declaration of conformity, where the manufacturer's production control is certified by a third party and initial type testing is done by a third party

This system is based on the following elements:

a) factory production control;

b) regular testing of factory samples by the manufacturer;

c) initial inspection of the plant and of the factory production by a certification body;

d) surveillance, assessment and approval of the ongoing factory production control by the certification body (routine inspections);

e) initial type testing of the product by a third party.

By the manufacturer's declaration of conformity, he verifies that his production is under factory production control (see clause 5), that this is certified and under ongoing surveillance of a certification body, and that the results of the production control show that the delivered products are in conformity with the specification. The manufacturer also declares that the product has been certified by a third party as having successfully completed initial type testing. Certification bodies shall fulfil the criteria of ISO/IEC Guide 40 and shall be accredited according to national rules, ISO 14001, ISO 14004 and ISO/IEC 17025.

4.5 System 4 — Product certification by an independent approved certification body

This system is based on the following elements:

a) factory production control;

b) regular testing of factory samples by the manufacturer;

c) initial inspection of the plant and of factory production control by the certification body;

d) initial type testing of the product by the certification body;

e) audit testing of samples taken by the certification body;

f) surveillance, assessment and approval of factory production by the certification body (routine inspections).

Certification bodies shall fulfil the criteria of ISO/IEC Guide 40 and be accredited according to national rules, ISO 14001, ISO 14004 and ISO/IEC 17025.

4.6 System 5 — Lot testing of the consignment by the customer or his representative

This system should be used

a) when consignments from unknown sources are delivered,

b) if the consignment is not accompanied by a manufacturer's declaration of conformity, or

c) if there are reasonable doubts in the specified properties of the consignment.

5 Factory production control

5.1 General

The purpose of the control is to ensure the products produced conform to the specification. Factory production control, as defined in this clause, is the most important element of Systems 1 to 4 for the attestation of conformity. If possible, it should also be the basis for System 5.

Factory production control comprises operational techniques and all measures necessary to maintain and regulate the quality of the product. It consists of continuous process monitoring, inspections and tests, and the utilization of their results with regard to equipment, raw materials and constituents, manufacturing processes and the product itself, and by taking account of the corresponding requirements given by the specification.

All necessary facilities, equipment and personnel shall be available to carry out the necessary inspections and tests indicated above. This requirement may also be fulfilled if, by means of a contract, the manufacturer or his agent involves a subcontractor having the necessary facilities, equipment and personnel.

5.2 Quality manual

For each manufacturing unit, the manufacturer shall provide a documented quality system (quality manual), which shall deal with the following elements of the manufacturer's quality system:

a) staffing and specifically the duties, responsibility and authority of the manufacturer's inspection personnel;

b) inspection methods and procedures in general, including complaints procedures and their documentation;

c) testing equipment and its calibration;

d) quality control of raw materials and constituents, batch identification and control;

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

f) product marking and production code;

g) handling of rejected lots;

h) procedures for product corrections;

i) internal documentation, including test records, production records, material certificates, etc.

5.3 Nature, extent and frequency of inspections and tests

The nature, extent and frequency of inspections and tests, direct or indirect, depend on the kind of products, the basic materials, the specific conditions of the plant and the production line.

The minimum frequency of inspections and tests to be performed by the manufacturer who produces thermal insulating products are stated in the following three tables.

Table 1 shows the main components to be controlled and the minimum frequency of checking.

Table 2 gives the minimum frequency of calibrations, or checks for control of test equipment under normal conditions. The calibrations or checks shall be repeated if any repair or modification occurs.

Table 3 indicates the minimum frequency of tests for control of the finished thermal insulating product for each production line/unit, unless this is specified in the product specification. Table 3 states the purpose of conducting such controls for each type of product according to their intended application.

Table 3 also contains indirect tests, which for certain properties are not tested directly (see 5.4).

All controls on raw constituent materials and processes shall be agreed between the producer and the certification body according to the main principles given below. It shall be considered as basic information about the condition of the production.

Table 1 — Control of raw and constituent materials

Main component to be controlled	Minimum frequency
Raw material by the material producer	each batch
Raw materials delivered under a certification scheme	not required
Composition of the raw material supplied	random

Table 2 — Control of test equipment

Equipment for determination of the following characteristics	Frequency/Additional test required	Calibration or checked by
Mass	once per month	calibrated weights
Thermal resistance or thermal conductivity	once per week	internal reference sample
	once per year	independent body (see)
Mechanical properties, dimensional changes, temperature measurements	once per year	independent body
Burning characteristics	according to national regulations	

Table 3 — Control of finished product for each production line

Measured property where required by product specification	Purpose	Minimum frequency	Additional testing for every change of
Mass per unit area, block or board	assist in predicting the density and mechanical properties	once per hour	nominal mass or change of product
Thickness	check compliance with requirements	once per hour	product or thickness
Dimensions: length and width	check compliance with requirements	once per hour	product or dimensions
Squareness	check compliance with requirements	once per every 2 h	dimensions
Density	predict thermal conductivity and mechanical properties	once per hour	density
Compressive strength	predict deformation resistance to check compliance with requirements	once per every 4 h	product
Thermal resistance/thermal conductivity, λ	check compliance with requirement and to verify the validity of any indirect testing	once per week	process (e.g. raw material, start-up conditions)
Burning characteristics	check compliance with requirements	as required by national regulations	product or significant composition changes
Dimensional change	check compliance with product requirements	once per week	product or significant composition changes
Water vapour permeability	check compliance with product requirements	once per month	product or significant composition changes
Water vapour sorption	check compliance with product requirements	once per month	product or significant composition changes
Water absorption	check compliance with product requirements	once per month	product or significant composition changes

5.4 Testing

Testing, particularly of thermal performance shall be performed by a laboratory that conforms to the requirements of ISO/IEC 17025. Qualification testing shall be performed according to the test methods given in the relevant specification. For certain properties indirect test methods may also be used for audit testing only, if a correlation can be established between the specified property X (which is the property to be tested) and another property Y. In the indirect test, the property Y is measured instead of the property X (e.g. air permeability or density instead of thermal conductivity).

In this case, the sampling plan and the compliance criteria for the indirect property Y shall be specified after taking into account the correlation between properties X and Y. If property X is to be correlated with more than one other property, the correlation shall be established in a similar fashion.

The correctness of the regression relationship between the specified property and the indirect test value shall be examined at fixed intervals. The examination shall also take place each time the production conditions change (e.g. when a new manufacturing procedure is introduced). The examination of correctness of the relationship shall be carried out separately for each place of production which operates under the same conditions.

5.5 Indirect testing

Indirect testing is a means by which a given property may be assessed through the testing of one or more other properties, with which a correlation has been established. Indirect testing may also be used to reduce the testing frequency of direct testing.

The correlation shall be established by regression analysis on the basis of adequate preliminary tests for each production unit. It shall be re-examined at prescribed intervals and after changes or modifications if these are likely to affect the correlation.

For each indirect testing procedure applied at the place of production, the sampling plan and the compliance criteria for the indirect property shall be specified, taking into account the relevant correlation between the corresponding properties.

The use of indirect testing shall result in the same confidence level on the property concerned as when using direct testing.

In case of dispute, the test method specified for the relevant property in the product standard shall be used.

5.6 Manufacturer's log

The results of factory production control are to be recorded into the manufacturer's log. The log shall contain a record of the description of the product, the date of manufacture, the testing methods and limits used, and identification of the person carrying out the inspection.

Where the product inspected does not satisfy the requirements as to the quality laid down in the specification, or if there is an indication that they do not do so, a note shall be made in the manufacturer's log as to the steps taken to deal with the situation (e.g. carrying out of a new inspection and/or measurers to correct the production process).

The manufacturer's log shall be kept for at least 5 years.

5.7 Persons responsible for factory production control

5.7.1 Inspection personnel

At every factory unit where thermal insulating products are manufactured, the manufacturer shall nominate a person who shall have appropriate knowledge and experience of the production of the products, to be responsible for conducting and supervising factory production control procedures, and ensuring that entries in the log are duly made.

5.7.2 Production personnel

The supplier shall establish and maintain procedures for identifying the training needs and provide for the training of all personnel activities affecting quality during production and installation. Personnel performing specific assigned tasks shall be qualified on the basis of appropriate education, training and/or experience, as required. Appropriate records of training shall be maintained.

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

If the results of the test are unsatisfactory, the manufacturer is obliged at once to take the steps necessary to rectify the shortcoming. Products which do not comply with the requirements shall be set aside and marked accordingly. When the shortcoming has been rectified, the test in question shall be repeated without delay, provided that this is technically possible, and is necessary as evidence that the defects have been overcome.

In the event that products are dispatched before the result of the inspection is available, then prompt notification shall be given to the customer to prevent any consequential damage.

6 Certification of factory production control and of products

6.1 General

The certification body who is responsible for either certifying the factory production control, thermal insulation, type testing or/and the product certification shall have the necessary competence, impartiality and integrity to fulfil these tasks. It shall fulfil the general criteria and shall have the technical competence for testing and certifying products, as required in ISO/IEC Guide 40. It may be accredited for this task by the national authority or another body which is authorized to accredit certification bodies.

6.2 Surveillance and assessment of factory production control

6.2.1 Initial inspection

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

The inspector of the certification body shall examine the manufacturer's top management documents, which outline their policy and objectives for, and commitment to, quality and to the proposed system.

The inspector shall, among other things, look into the manufacturer's quality manual and assess the suitability of the provisions of it. The inspector shall ensure the availability of the technical requirements for the product (for example, the specification), “Scheme of Supervision and Control”, “Quality Manual”, and other documents essential to factory inspections, at the relevant places and persons in the manufacturing unit. If indirect testing of specified properties is performed, the manufacturer shall prove the correlation between direct and indirect testing to the satisfaction of the certification body. The certification body shall examine these correlations at fixed intervals, especially those listed in 5.4 and 5.5. For the manufacturing unit to pass this initial inspection, the inspector shall be satisfied with each of the items referred to above.

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

6.2.2 Routine inspections

The principal objective of a routine inspection is to check whether the prerequisites for manufacturing and the agreed factory production control system are maintained or improved.

For this purpose, the report of the initial factory inspection as a statement of the agreed quality control system is used.

As a minimum, during a routine inspection, the test results from manufacturer's quality control shall be examined to ensure that the required testing has been carried out at the appropriate frequency, and that proper action has been taken, including those on calibration and maintenance of test equipment.

Marking and labelling of the products shall be checked during the inspection.

The results of the routine inspections shall be documented in a record of the inspection.

The routine inspections shall be normally performed twice a year. They shall not be announced to the factory. Refer to Table 4 and 6.3.3.

6.2.3 Certificate of factory production control

When a manufacturing unit has passed the initial inspection to the satisfaction of the certification body, this body will issue a certificate to confirm that the production is in line with the requirements of this specification for factory

production; this applies only to System 2, System 3 or System 4. The certificate shall be confirmed every year after routine inspections.

6.3 Product certification

6.3.1 Product certification with surveillance and factory production control

Product certification is only possible for those manufacturing units which are under the regime of a surveillance and factory production control.

If there is certification of the production control, this should be incorporated into the product certification. If another certification body performs it, close cooperation between the two certification bodies is necessary.

6.3.2 Type testing

Prior to starting the surveillance of the plant, each product type, which claims to be under the rule of the certification scheme, shall be tested completely by the certification body in accordance with the relevant specifications and requirements which are claimed to be fulfilled.

In the case of products differing only in the kind of facing or the dimensions, there is no need for separate testing of properties which are not affected by the different facing or dimensions.

The certification body shall take the samples for type testing, normally during the initial inspection of the plant.

A sample shall be as described in the relevant product specification.

The sample shall be taken out of the inspection lot, at random, without regard to its quality on the sampler's discretion. It shall be marked so that there is no possibility of error. The sampler shall prepare a record of the sampling procedure. The test report shall comply with the relevant clauses of the product specification.

6.3.3 Audit testing

During the routine inspection, at the discretion of the certification body, samples for the factory-inspected production shall be taken for testing compliance with the specification. In case of dispute, samples may also be taken from the open market.

The certification body shall determine the appropriate frequency for each production unit, in which audit testing on the finished product should be conducted, taking account of the individual circumstances. In any case, the frequency should not be less than stated in the relevant table of the product specification.

Table 4 gives guidance for the product specifications. Unless specified in the product specification, the requirements indicated in Table 4 apply.

Table 4 — Minimum frequency of audit testing of finished thermal insulation products by the certification body

Measured property	Minimum frequency
Dimensions: length width thickness squareness flatness	Once per year at two different thicknesses
Thermal transmission properties	Four times per year at two different thicknesses
Fire behaviour	According to national regulations
Other properties	To be stated in the product specification

6.3.4 Conformity marking

Each product under the regime of a certification scheme shall be marked with a mark of conformity on the product or on the label according to the relevant clause of the specification. As soon as the inspection has been completed, the certification body will authorize the use of the mark of conformity, provided that the manufacturing unit has passed the initial inspection and the product has passed the initial type testing.

The mark of conformity, which shows compliance with this specification, shall refer to this specification and the relevant product specification. It shall indicate the certification body.

The manufacturer is no longer allowed to use the conformity mark if the certification body has discontinued the surveillance.

6.4 Measures in the case of non-compliance with the specification or other omissions

The certification body shall require the manufacturer to rectify the defect within a reasonably short period (not to exceed 1 month) where non-compliance with the specification is identified or defects have been revealed in the manufacturing process or in the factory production control.

The certification body shall perform an extraordinary inspection and follow-up test after the given period has passed.

The inspector may not consider an extraordinary inspection necessary for cases of less serious defects if the manufacturer supplies him with information that satisfies him.

The certification body shall discontinue the surveillance and approval of the factory production control, the tested product or type of product and shall inform the manufacturer and the competent authority if the extraordinary inspection or the follow-up tests are not passed. The manufacturer may no longer refer to certification of factory production control and the products shall not be marked in accordance with the certification scheme after approval has been discontinued.

7 Sampling

This clause applies to all conformity control systems of the specification.

A sample may consist of one or several items. In the case of boards or mats, the item shall be one package of boards or mats; in the case of rolls, it shall be one roll.

The items shall be taken out of the inspection lot at random at the sampler's discretion without regard to their quality.

The samples shall be marked so that there is no possibility of error. The sampler shall prepare a record of the sampling procedure. The place where the sample is to be taken depends on the type of conformity control, as follows.

— For Systems 1 to 4, they shall be taken from current production.

— For System 5, they may be taken from dispatch store or from the delivery vessel (truck, ship, etc.).

The inspection lot shall consist of mats, boards or rolls of the same nominal quality, etc., which are produced under the same conditions in the same plant, at the same production line and over a limited time period.

An inspection lot may consist of one or more homogeneous consignment, if they were produced under equal conditions. Products differing only in the kind of facing or in dimensions may be taken of the same inspection lot, if the different properties do not affect the test results.

8 Sample size and acceptance criteria for lot testing (System 5)

8.1 Sampling and sample size

Clause 7 applies for sampling.

The sample size is specified on the condition that no previous information is available as a result of the manufacturer's factory control.

Table 5 lists the sample size in relation to the lot size. There shall be a minimum of one sample taken per week.

If additional lots are taken from batches which have already been tested in accordance with Systems 1 to 4, and the results of which are known (e.g. in case of doubt or by agreement between the manufacturer and purchaser), the size of the lot may be smaller and agreed upon between the manufacturer and purchaser, taking into account the reason for this additional lot testing.

The inspection lot should not be smaller than 1 500-m^2 insulation area, but it should not cover more than the production of one week.

For lots considerably smaller than 1 500 m^2, the method of compliance control recommended in this clause is not economic; special agreements, depending on the importance of the application, should be made between the manufacturer and purchaser.

Table 5 — Sampling plan for conformity control (System 5)

Lot size m^2	Sample size for attribute testing (Number of packages or rolls)	
	First sample	Total (Minimum 1 per week)
1500	2	4
2 500	3	6
5 000	5	10
9 000	8	16
15 000	13	26
28 000	20	40
over 28 000	32	64
NOTE 1 The normal inspection level according to ISO 2859-1 has been chosen.		
NOTE 2 The sample size has been chosen on the assumption that for inspection by attributes, a double sampling plan will be applied.		
NOTE 3 The sample size in this table is based on ISO 2859-1using 100 m^2 as a single unit.		

8.2 Acceptance criteria

8.2.1 General

The conformity or non-conformity is judged on the basis of the conformity criteria. Conformity leads to acceptance, while non-conformity may lead to further actions agreed upon between the manufacturer and purchaser.

8.2.2 Test specimens and testing

For acceptance testing, all elements of a package (one item) are deemed to be of the same quality, so that the necessary test specimens may be taken or cut out of the item at the discretion of the tester, subject to any limitations imposed by the test method. The number of specimens from one item to get one test result (average value) depends on the test methods given in the product specification.

Testing shall be carried out according to the test methods given in the product specification.

8.2.3 Classification of defects

In accordance with ISO 2859-1, the defects for the different properties shall be classified into critical defects, major defects and minor defects in the product specification, in a table such as Table 6, unless a different classification is agreed upon for certain applications.

Table 6 — Classification of defects

Classification of defects	Property	Clause(s) (reference product specification)
Critical defects		
Major defects		
Minor defects		

8.2.4 Acceptance criteria for inspection by attributes

The compliance criteria of this clause imply the following AQLs (acceptance quality limits) for the defect clauses.

The chosen AQL does not imply that the producer has the right to supply knowingly any defective item of the product.

All properties shall be considered separately. The lot shall be rejected if any property fails to achieve the relevant acceptance criteria for that property (see Table 7).

The number of items tested initially shall be equal to the sample size of column 1 of Table 8. If the number of defectives found in the first sample for the relevant property is equal to or less than the first acceptance number Ac (column 3 or column 7 of Table 8), the lot shall be considered acceptable.

If the number of defectives found in the first sample for the relevant property is between the first acceptance and rejection numbers, the total sample size (column 2 of Table 8) shall be inspected for the relevant property. The number of defectives found in the first and second sample shall be accumulated.

If the total number of defectives for the relevant property is equal to or less than the total acceptance number Ac, (column 5 or column 9 of Table 8), the lot shall be considered acceptable. If the total number of defectives for the relevant property is equal to or greater than the total rejection number Re (column 6 or column 10 of Table 8), the lot shall be rejected.

Table 7 — Acceptance quality limits (AQLs) by attribute

Defect clause	Example characteristic	AQLs
Critical	Fire behaviour	Depending on national regulations
Major	Thermal resistance/thermal conductivity Thickness	10
Minor		15

Table 8 — Acceptance criteria for inspection by attributes

Column number									
1	2	3	4	5	6	7	8	9	10
Sample size		Major defects				Minor defects			
First sample	Total sample	First sample		Total sample		First sample		Total sample	
		Acceptance number (Ac)	Rejection number (Re)	Acceptance number (Ac)	Rejection number (Re)	Acceptance number (Ac)	Rejection number (Re)	Acceptance number (Ac)	Rejection number (Re)
2	4	0	2	1	2	0	2	1	2
3	6	0	2	1	2	0	2	3	4
5	10	0	3	3	4	1	4	4	5
8	16	1	4	4	5	2	5	6	7
13	26	2	5	6	7	3	7	8	9
20	40	3	8	8	9	5	9	12	13
32	64	5	9	12	13	7	11	18	19

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