

**European
INSULATION KEYMARK
Scheme
for
Thermal Insulation Products**

Revision: 2.1

(2019-09-23)

	INSULATION KEYMARK Scheme	Revision: 2.1 Date: 2019-09-23 Page: 2 of 28
---	------------------------------	--

Foreword

This KEYMARK Scheme for Thermal Insulation Products is prepared by the European Scheme Development Group 5 (SDG-5) for Thermal Insulation Products under coordination of the Quality Assurance Committee (QAC) and is finally approved by DIN CERTCO as the KEYMARK Management Organization on behalf of CEN.

Revision of INSULATION KEYMARK certification documents

Documents will be revised by issue of revised editions or amendments. Details will be posted on the website at <http://www.keymark.eu>.

Technical or other changes which affect the requirements for the approval or certification of the product or service will result in a new issue. Minor or administrative changes (e.g. corrections of spelling and typographical errors, changes to address and copyright details, the addition of notes for clarification etc.) may be made as amendments.

The issue number will be given in decimal format with the integer part giving the issue number and the fractional part giving the number of amendments (e.g. Issue 3.2 indicates that the document is at Issue 3 with 2 amendments).

Users of this document should ensure that they possess the latest issue and all amendments.

Start of validity

This certification scheme comes into effect on 2019-09-23 with a transition period of 1 year.

The fees (Appendix E) come into effect on 2020-01-01.



Contents	Page
1 Introduction	4
2 Scope.....	5
3 Abbreviations	7
4 References.....	7
5 Quality Assurance Committee (QAC) – Scheme-Development-Group 5 (SDG-5)	8
6 Definitions.....	8
7 Certification System	9
7.1 Common acceptance of conformity assessment procedures and results.....	9
7.2 General.....	10
7.3 Product Grouping.....	10
7.4 Factory Production Control (FPC)	11
7.5 Initial Inspection and Initial Testing (IT)	11
7.6 Surveillance procedures.....	13
7.6.1 Inspection and surveillance of the factory and Factory Production Control	13
7.6.2 Audit testing	13
7.6.3 Evaluation of test results.....	14
7.6.4 Actions in the case of non-conformity	15
7.6.5 Extraordinary inspection	16
7.7 Fees.....	17
7.8 Flow chart.....	18
7.9 Conformity mark (KEYMARK).....	20
7.9.1 General.....	20
7.9.2 KEYMARK Certificate.....	20
7.9.3 Labelling.....	21
7.9.4 Withdrawal of KEYMARK Certificate	21
7.10 Website	21
7.11 Content of the manufacturer's application file.....	22
8 Rules for complaints, disputes and appeals.....	23
8.1 Complaints about certified products.....	23
8.2 Complaints about certification bodies.....	23
8.3 Disputes about test results.....	23
8.4 Test result arbitration procedure.....	23
8.5 Appeals.....	24
8.5.1 Appeal to a Certification Body	24
8.5.2 Appeal to the Quality Assurance Secretariat.....	24
9 Overview of the Insulation KEYMARK System.....	25

Annex A : Requirements for comparative checking of manufacturers equipment for thermal conductivity measurement used in FPC

	INSULATION KEYMARK Scheme	Revision: 2.1 Date: 2019-09-23 Page: 4 of 28
---	------------------------------	--

1 Introduction

European harmonized product standards and supporting test method standards for thermal insulation products have been developed within CEN/TC 88 and provide the basis for CE marking of products to show compliance with the Construction Products Regulation (CPR) EU 305/2011.

Conformity with the requirements of the CPR (CE marking) corresponds with the minimum legal requirements as mentioned in NOTE 1.

Whereas mandatory CE marking is concerned only with the basic works requirements under the CPR and thus with only a limited number of characteristics, voluntary product certification is concerned with all characteristics defined within the product standards.

Having recognised that the consumer requires more than this minimum legal level of conformity (see NOTE 1), the representatives of the European insulation industries have deliberately written the thermal insulation product standards to provide for the manufacturer the possibility to declare specific levels for certain characteristics.

The KEYMARK for thermal insulation products provides a means for the demonstration of conformity to quality levels rather than the minimum legal level.

Consequently, the KEYMARK necessarily extends beyond the conformity to the basic works requirements of the CPR (see NOTE 2).

The scheme has been developed by a mixed group of representatives from industry, testing institutes and certification organisations, with the broad agreement of the European insulation industries.

The scheme rules have been prepared by Scheme Development Group (SDG-5 of the Quality assurance committee, established under the authority of the KEYMARK Management Organisation (KMO).

Insulation products carrying the KEYMARK must have a significantly positive energy balance: This means the reductions in energy used and emissions produced during the service life of a KEYMARK certified insulation product by far exceed the energy required for and the emissions generated during its production and later disposal

Be sure always to have the latest version of these scheme rules, available at the website <http://www.keymark.eu>.

NOTE 1 The Verification of Constancy of Performance procedures for CE marking of thermal insulation products are only dependent on the reaction to fire classification of the products where stated in the product standard.

NOTE 2 The attestation of conformity procedures for the KEYMARK provide product certification related to all of the requirements of the standard and characteristics (properties) of the product as declared by the manufacturer complementing the requirements for CE marking. Product audit testing is included.

	INSULATION KEYMARK Scheme	Revision: 2.1 Date: 2019-09-23 Page: 5 of 28
---	------------------------------	--

2 Scope

These Specific KEYMARK Scheme Rules for thermal insulation products are acting as a supplement to the CEN/CENELEC INTERNAL REGULATIONS –PART 4: “*Certification*”. This document is hereafter referred to as *CEN/CENELEC Internal Regulation*.

The technical content of the evaluation of the conformity procedure for products shall follow EN 13172 and EN ISO 13787 as amended or revised with the additions as defined in these scheme rules.

The scheme is currently applicable to thermal insulation products included in the following European Product Standards as amended or revised. Other product standards in the work program of CEN/TC 88 may be added at a later date.

For the Intended use: Thermal insulation for buildings (KEYMARK)

EN 13162, *Thermal insulation products for buildings – Factory made mineral wool (MW) products – Specification*

EN 13163, *Thermal insulation products for buildings – Factory made products of expanded polystyrene (EPS) – Specification*

EN 13164, *Thermal insulation products for buildings – Factory made products of extruded polystyrene foam (XPS) – Specification*

EN 13165, *Thermal insulation products for buildings – Factory made products of rigid polyurethane foam (PU) – Specification*

EN 13166, *Thermal insulation products for buildings – Factory made products of phenolic foam (PF) – Specification*

EN 13167, *Thermal insulation products for buildings – Factory made cellular glass (CG) products – Specification*

EN 13168, *Thermal insulation products for buildings – Factory made products of wood wool (WW) – Specification*

EN 13169, *Thermal insulation products for buildings – Factory made products of expanded perlite (EPB) – Specification*

EN 13170, *Thermal insulation products for buildings – Factory made expanded cork (ICB) products – Specification*

EN 13171, *Thermal insulation products for buildings – Factory made wood fibre (WF) products – Specification*

EN 14063-1, *Thermal insulation products for buildings – In-situ formed expanded clay lightweight aggregate products – Part 1: Specification for the loose-fill products before installation*

EN 14064-1, *Thermal insulation products for buildings – In-situ formed loose-fill mineral wool (MW) products – Part 1: Specification for the loose-fill products before installation*

EN 14315-1, *Thermal insulation products for buildings – In-situ formed sprayed rigid polyurethane (PUR) and polyisocyanurate (PIR) foam products – Part 1: Specification for the rigid foam spray system before installation*

	INSULATION KEYMARK Scheme	Revision: 2.1 Date: 2019-09-23 Page: 6 of 28
---	--	---

EN 14316-1, *Thermal insulation products for buildings – In-situ thermal insulation formed from expanded perlite (EP) products – Part 1: Specification for bonded and loose-fill products before installation*

EN 14317-1, *Thermal insulation products for buildings – In-situ thermal insulation formed from exfoliated vermiculite (EV) products – Part 1: Specification for bonded and loose-fill products before installation*

EN 14318-1, *Thermal insulation products for buildings – In-situ formed dispensed rigid polyurethane (PUR) and polyisocyanurate (PIR) foam products – Part 1: Specification for the rigid foam dispensed system before installation*

EN 15101-1, *Thermal insulation products for buildings – In-situ formed loose fill cellulose (LFCI) products – Part 1: Specification for the products before installation*

EN 16069, *Thermal insulation products for buildings – Factory made products of polyethylene foam (PEF) - Specification*

For the Intended use: Thermal insulation for building equipment and industrial installations (VDI/KEYMARK)

EN 14303, *Thermal insulation products for building equipment and industrial installations – Factory made mineral wool (MW) products – Specification*

EN 14304, *Thermal insulation products for building equipment and industrial installations – Factory made flexible elastomeric foam (FEF) products – Specification*

EN 14305, *Thermal insulation products for building equipment and industrial installations – Factory made cellular glass (CG) products – Specification*

EN 14306, *Thermal insulation products for building equipment and industrial installations – Factory made calcium silicate (CS) products – Specification*

EN 14307, *Thermal insulation products for building equipment and industrial installations – Factory made extruded polystyrene foam (XPS) products – Specification*

EN 14308, *Thermal insulation products for building equipment and industrial installations – Factory made rigid polyurethane foam (PUR) and polyisocyanurate foam (PIR) products – Specification*

EN 14309, *Thermal insulation products for building equipment and industrial installations – Factory made products of expanded polystyrene (EPS) – Specification*

EN 14313, *Thermal insulation products for building equipment and industrial installations – Factory made polyethylene foam (PEF) products – Specification*

EN 14314, *Thermal insulation products for building equipment and industrial installations – Factory made phenolic foam (PF) products – Specification*

EN 15501, *Thermal insulation products for building equipment and industrial installations – Factory made expanded perlite (EP) and exfoliated vermiculite (EV) products – Specification*

EN 14319-1, *Thermal insulating products for building equipment and industrial installations – In-situ formed dispensed rigid polyurethane foam (PUR) products – Part 1: Specification for the rigid foam dispensed system before installation*

EN 14320-1, *Thermal insulating products for building equipment and industrial installations – In-situ formed sprayed rigid polyurethane foam (PUR) products – Part 1: Specification for the rigid foam spray system before installation*

	INSULATION KEYMARK Scheme	Revision: 2.1 Date: 2019-09-23 Page: 7 of 28
---	------------------------------	--

EN 15599-1, *Thermal insulation products for building equipment and industrial installations – in situ thermal insulation formed from expanded perlite (EP) products – Part 1: Specification for bonded and loose-fill products before installation*

EN 15600-1, *Thermal insulation products for building equipment and industrial installations – in situ thermal insulation formed from exfoliated vermiculite (EV) products – Part 1: Specification for bonded and loose-fill products before installation*

These scheme rules shall also be read in conjunction with the cooperation agreement between CEN and VDI for thermal insulation products for building equipment and industrial installations.

NOTE 1 The VDI-Mark has been applied for more than two decades and requires a high quality level for insulation products for building equipment and industrial installations in the European market. The quality assurance scheme was established by VDI-Gesellschaft Energie und Umwelt (VDI-GEU), Düsseldorf, for thermal insulation products for industrial applications based upon the Guideline VDI 2055 part 2.

3 Abbreviations

CPR Construction Products Regulation (EU No 305/2011)

DoP Declaration of Performance

EEA European Economic Area

FPC Factory Production Control

SDG Scheme Development Group

IT Initial Test (in terms of KEYMARK)

QAC Quality Assurance Committee

KMO KEYMARK Management Organisation

RtF Reaction to Fire

ST(+) Maximum Service Temperature

ST(-) Minimum Service Temperature

4 References

CPR, *REGULATION (EU) No 305/2011 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 9 March 2011 laying down harmonised conditions for the marketing of construction products and repealing Council Directive 89/106/EEC*

CEN/CENELEC Internal Regulations Part 4 “Certification”

EN 13172, *Thermal insulation products – Evaluation of conformity*

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

EN ISO/IEC 17065, *Conformity assessment – Requirements for bodies certifying products, processes and services*

	INSULATION KEYMARK Scheme	Revision: 2.1 Date: 2019-09-23 Page: 8 of 28
---	------------------------------	--

EN ISO/IEC 17067, *Conformity assessment – Fundamentals of product certification and guidelines for product certification schemes*

EN ISO 13787, *Thermal insulation products for building equipment and industrial installations - Determination of declared thermal conductivity*

VDI 2055 part 2, *Thermal insulation of heated and refrigerated operational installations in the industry and in the building services - Technical basics for the verification of properties of insulating materials*

Appendix A, *Checklist for inspection bodies for audits in the factory (Example of an Audit report)*

Appendix B, *Requirements for bodies engaged in Certification, Testing and Inspection*

Appendix B1, *Framework for the activities of Registered Laboratories for conductivity measurements and other characteristics which can be declared (insulation products for buildings)*

Appendix B2, *Framework for the activities of Registered Laboratories for measurements of thermal conductivity curve, maximum service temperature and chloride content (insulation products for building equipment and industrial installations)*

Appendix C, *Checklist for auditors of candidate registered laboratories*

Appendix D, *Scheme implementation rules*

Appendix E, *Insulation KEYMARK - Fees*

Appendix F, *Product Grouping Examples*

Appendix G, *Minimum content of KEYMARK Certificates*

5 Quality Assurance Committee (QAC) – Scheme-Development-Group 5 (SDG-5)

The Quality Assurance Committee with its Scheme-Development-Group 5 is responsible for the scheme rules and their maintenance, although it is understood that changes of these rules need to be confirmed (for VDI/KEYMARK separately in the two organisations) before being applicable. This joint working group shall endeavour to ensure that it is composed of the major actors, with representation from all parties concerned (manufacturers, contractors, users, laboratories and certification bodies).

The VDI scheme shall be managed in a specific Appendix.

6 Definitions

Empowered Certification Body

A certification body that is empowered by the KEYMARK Management Organisation to participate in the implementation of this KEYMARK scheme.

Registered laboratory

Fulfils the requirements of the Scheme, has a valid registration of the QAC for thermal insulation products for buildings according to EN 12667 and/or 12939 or, for thermal insulation products for building equipment and industrial installations according to EN 13468, EN 12667 and/or EN 12939, EN ISO 8497 and/or EN 14706 / EN 14707. A notification as a Testing Laboratory for the relevant European product standard is required. Acts on behalf of the Empowered Certification Body.

	INSULATION KEYMARK Scheme	Revision: 2.1 Date: 2019-09-23 Page: 9 of 28
---	------------------------------	--

Testing laboratory

Body responsible for determining of one or more product characteristics according to a test method referred to in a product standard, for which registration (see above) is not required

Inspection Body

Body with personnel involved in inspection who fulfils the requirements of the Scheme. Act on behalf of the Empowered Certification Body.

Test result

One or more single measuring values according relevant product standard evaluated as a mean value.

Product

A product introduced with a brand name in the market (EEA).

Product family

Several products with identical declared properties (except Reaction to Fire for different facings).

Sample

Product with defined thickness (or/and inner diameter for preformed products) or production date.

Product Certification

Certification of single Products (brand names) or Product families. A KEYMARK Certificate can be issued if all declared properties are tested positive (only the Reaction to Fire can be grouped by property).

Product Group Certification (Property by Property)

Grouping of products in respect of declared properties of the nearly whole production, defined in values, steps and levels for one production site or one production line /unit. A KEYMARK Certificate for the grouped products can be issued if all declared Property Groups are tested positive.

Legal Entity

The manufacturer, or the responsible (distributor, importer or the authorised representative), for bringing the product onto the market (EEA), which sign up a contract with an KEYMARK empowered certification body so as to certify the declared values of a product according the KEYMARK procedures. As such the certified organisation is responsible for bringing the KEYMARK-certified product onto the market (EEA) as part of his product portfolio which is produced at one or more locations (plants) and for which the KEYMARK empowered certification body can perform surveillance onto the FPC and the necessary audit testing.

7 Certification System

7.1 Common acceptance of conformity assessment procedures and results

Mutual recognition of conformity assessment procedures and results between actors in the scheme is of fundamental importance. Tasks performed in the CE marking procedures should be taken into account for the KEYMARK certification procedures. In case the CE marking activities are performed by a different third party an agreement of acceptance shall be established between the two third parties.

	INSULATION KEYMARK Scheme	Revision: 2.1 Date: 2019-09-23 Page: 10 of 28
---	------------------------------	---

7.2 General

The KEYMARK scheme is based on the Product Certification Scheme Type 5 as defined in EN ISO/IEC 17067:

Tasks for the manufacturer:

- Implementation and maintenance of a Factory Production Control (FPC) system
- Continuous product testing of samples taken at the factory by the manufacturer in accordance with a prescribed test plan (see relevant product standard)
- Product grouping were relevant with acceptance of the empowered certification body

Tasks under responsibility of the Empowered Certification Body:

- Initial inspection of factory and of FPC
- Sample taking of products, representative for the product to be placed on the market
- Initial testing (IT) by a Testing laboratory (see NOTE 1)
- Issuing a certification contract with all certified products / product groups
- Conformity assessment procedure
- Issuing and management of KEYMARK Certificates
- Annual Tasks (once the KEYMARK Certificate has been issued)
 - o Continuous surveillance, assessment and approval of Factory Production Control
 - o Audit testing by Testing laboratory of samples taken at the factory (see NOTE 1)
 - o Confirmation of KEYMARK Certificates

These tasks are performed in accordance with the relevant product standards and EN 13172. When all requirements have been met by the manufacturer and of the product declaration, the Certification body issues a KEYMARK Certificate of the product or product group. All declared performances will be seen as limit values.

NOTE 1 Use of a registered laboratory is necessary for tests in accordance with, for thermal insulation products for buildings, EN 12667 and/or 12939 or, for thermal insulation products for building equipment, EN 13468, EN 12667, EN 12939, EN ISO 8497 and/or EN 14706 / EN 14707.

NOTE 2 The scheme rules will adopt all decisions with regard to conformity assessment with the product standards, taken by Sector Group 19 "Thermal insulation" of the Group of Notified Bodies under the CPR.

7.3 Product Grouping

There are two main aims of grouping:

- To provide the opportunity to obtain more meaningful statistical data, by combining the data for products demonstrating a similar distribution. It reduces cases where insufficient data is available for statistical evaluation and improves factory production control (FPC).
- Grouping can reduce the amount of necessary testing. The level of testing associated with the KEYMARK scheme is already substantial (see below) and grouping is needed to make the system manageable.

There are some major principles referenced in the standard associated with thermal insulation products:

- The group of products shall only contain products covered by the EN product standards and manufactured by the same production process methodology using the same kind of raw materials (e.g. glass/stone for MW or same blowing agent for PU).
- To declare the values within the CE-marking and KEYMARK, the manufacturer shall measure, calculate, and declare the characteristic per group/product according its testing plan per

	INSULATION KEYMARK Scheme	Revision: 2.1 Date: 2019-09-23 Page: 11 of 28
---	--	--

line/per unit as part of the FPC. The manufacturer shall also document the influences of the production process specifications, incoming material and facing to the properties upon which the grouping is based.

- To assess and to certify the declared values, the certification body shall check the manufacturers figures in comparison of the results of the Initial Testing and, in the frame of the KEYMARK-certification, of the audit testing (per location)
- Grouping products property by property is only possible for KEYMARK Group Certificates (see section 7.9.2) and refer to nearly all products of the production site.
- The manufacturer shall be careful in grouping the products property by property, especially to prevent non-conformity results coming out from the 3rd party activities and can lead to the withdrawal of the KEYMARK Certificate for all the products of the group.

The grouping that the manufacturer uses within his FPC shall be documented within the quality system.

The manufacturer is advised to create a grouping diagram or table for each product and from every production unit/line, based on their FPC. The quality plan and the statistical evaluation of the continuing production shall be based on this diagram.

The manufacturer shall make all grouping diagrams or tables available to the certification body for acceptance and to provide a basis for all auditing and testing of continuing production. The manufacturer shall notify the certification body whenever the diagram is modified in such a way that the declared properties for one or more product would change. Any changes made to the diagram will only be valid for production after the date on which the change becomes effective.

The grouping diagrams are confidential between the certification body and the manufacturer.

Certification bodies will share the information regarding grouping with inspection bodies, as required for the necessary completion of their activities. Manufacturer's point should be accepted in high majority of cases. Where the logic of the grouping is in doubt by the certification body, the manufacturer shall provide a rationale to support the proposed grouping. If the certification body does not support the rationale, additional testing may be required to ensure the validity of the grouping. In this situation, the failure of one product within the disputed grouping will not apply to the whole group, if analysis of the information results in the removal of the failed product from that grouping, and acceptance of the revised grouping by the certification body.

Appendix F shows the different ways of Product Grouping with examples.

7.4 Factory Production Control (FPC)

Precondition for the certification is the establishment and the operation of a specific product-related FPC, taking into account the elements of EN ISO 9001 and the process of the related production line / unit from the raw material to finished product and storage of the product.

The FPC shall form an integral part of the client's quality management system, if any.

7.5 Initial Inspection and Initial Testing (IT)

The Initial Inspection shall determine whether the prerequisites for staff and equipment, for continuous and orderly manufacture and for the corresponding factory production control, are in accordance with EN 13172. The results and recommendations from the Initial Inspection shall be documented in an assessment report.

Sampling for Initial Testing shall be carried out by the representative of the Certification Body, normally during the Initial Inspection, with the manufacturer's representative present. The samples shall be taken

	INSULATION KEYMARK Scheme	Revision: 2.1 Date: 2019-09-23 Page: 12 of 28
---	------------------------------	---

from products identified as finished products ready for delivery, cover the range of thickness (minimum till maximum) declared by the manufacturer. During the sampling four samples with different production dates or dimensions shall be selected to ensure the sampling is representative for the production in general. The sample shall be taken at random and shall be representative of normal production and clearly identified to ensure that the sample is used for testing. The representative of the Certification Body shall record the following details:

- manufacturer name and address;
- description of the product;
- how the product is identified;
- manufacturer's marking of the product;
- inspection lot size;
- sample size;
- location and date of sampling;
- all necessary information about the product for testing, including shift or time of production and production line/unit or traceability code.

The record shall be agreed and signed by the representative of the Certification Body and the manufacturer's representative.

Each product, which is submitted for assessment, shall be initially tested by the Testing Laboratory in accordance with the product standard. Initial Testing will be performed for all characteristics declared by the manufacturer. The number of test results to be determined is **four** per declared characteristics and per production line/unit. The number of four test results can be spread over 2 years. For new products (not only a new name for marketing reasons) which can be grouped in existing product groups only **two** test results for all declared characteristics per production line/unit are required.

Only **one** test result per production line/unit is required for

- reaction to fire characteristics
- compressive creep
- Minimum/Maximum Service Temperature and
- Temperature dependent Thermal Conductivity for flat products

All test results for each tested property shall be better than or equal to the declared value.

Initial testing shall be repeated on changes or modifications if these are likely to affect the conformity of the products with their declared performance.

The acceptance of already existing test reports for Initial testing is under the responsibility of the involved empowered certification body with respect to all requirements of the KEYMARK scheme.

NOTE 1 The minimum stock of products from which the sample is taken should be large enough to obtain a representative sample for the tests required.

NOTE 2 For new production lines/units the normal evaluation of conformity procedures applies. For the manufacturer starting a line/unit, identical in terms of product performance to an existing line/unit, and for existing products/product groups, a special agreement may be made to handle the practical start of production

	INSULATION KEYMARK Scheme	Revision: 2.1 Date: 2019-09-23 Page: 13 of 28
---	------------------------------	---

and the performance of Initial Testing ensuring that all evaluation of conformity requirements are finalised within a period of less than 6 months. In any case the manufacturer has the full responsibility for the declared values.

NOTE 3 In any cases the chosen samples for testing shall follow the worst case approach.

7.6 Surveillance procedures

7.6.1 Inspection and surveillance of the factory and Factory Production Control

Routine inspections shall be performed to assess the continued conformity of the manufacturer's factory production control system to the requirements of EN 13172. Reference shall be made to the records of the Initial Inspection and/or previous routine inspections to ensure changes to the manufacturer's factory production control system are assessed.

Records of inspections shall include details of the status of the factory production control system as it exists on the date of the inspection.

During each routine inspection, the following shall be specifically examined:

- results of the manufacturer's own testing to check:
 - whether tests have been performed at the specified frequency according to the relevant product standard and
 - that only products that have conformed to the product standard have been released;
- that proper corrective actions have been taken when required;
- the calibration and maintenance of test equipment;
- the marking and labelling of products.

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

The routine inspections shall be performed twice a year, unless additional extraordinary inspections are carried out. The routine inspections shall be planned to ensure that all relevant functions of the manufacturer are assessed during a prescribed period. The inspections shall aim at reflecting the normal working manner of the factory. Inspections may be carried out without any previous announcement.

A checklist for FPC inspections is given in Appendix A.

For checking the thermal conductivity measurement equipment of the manufacturer producing thermal insulation products for buildings, see annex A of this document.

7.6.2 Audit testing

Audit samples shall be taken for checking conformity with the product standard. Samples shall be taken at random normally during a routine inspection at the factory and they shall be representative of the normal production. Only if it is agreed between the Certification Body and the manufacturer, shall samples be taken from elsewhere.

The representative of the Certification Body shall ensure that the manufacturer is aware of his responsibility to forward the selected samples to the testing laboratory in proper condition and without undue delay.

Audit testing shall be performed for all declared characteristics once a year, except for:

- sound absorption ,
- special characteristics without FPC requirements,

	INSULATION KEYMARK Scheme	Revision: 2.1 Date: 2019-09-23 Page: 14 of 28
---	------------------------------	---

- except for the reaction to fire, where the frequency shall be once every 2 years,
- testing is agreed between parties,
- compressive creep, where the frequency is according to the relevant product standard.

Samples shall be selected under the responsibility of the certification body to get the necessary test results for each declared property of the Product / Property Group from each factory (see details in 7.6.3 and 7.6.4). In any cases the chosen samples for testing shall follow the worst case approach.

For thermal insulation products with harmonised product standards the declared characteristics are written in the Declaration of performance (DoP).

Testing shall be carried out in accordance with the relevant product standard bearing in mind the number of tests necessary to achieve one test result.

Where appropriate a comparison shall be made between the manufacturer's routine test results, results of witness testing, and the results of testing by the Testing Body.

7.6.3 Evaluation of test results

All test results for each tested characteristic shall be better than or equal to the declared values.

For the evaluation of the declared thermal conductivity curve of thermal insulation products of building equipment and industrial installations EN ISO 13787 apply.

The table 1 shows the principle of evaluation of test results during surveillance and the recommended number of samples.

Table 1: Principle of evaluation of test results during surveillance

Insulation KEYMARK Certification	Product Certification		Group Certification
Product Group	Product by Product		Property by Property of nearly all products of the production site
Thermal insulation for	Building equipment and industrial installations	Buildings	
Recommended number of samples	3 samples (1 λ test) (1+2) for EN ISO 13787	1 sample	Sampling Plan to cover all Property Groups under consideration of critical representatives
Principle of evaluation for thermal conductivity	Limit value 1 test result $\lambda(9)$ and EN ISO 13787 10% rule 2 extra $\lambda(9)$ mean of 3 $\lambda(9)$ DoP as limit $\lambda(9)$	Limit Value (1 test result) DoP as limit values also R_D and/or λ_D	

	INSULATION KEYMARK Scheme	Revision: 2.1 Date: 2019-09-23 Page: 15 of 28
---	------------------------------	---

Principle of evaluation for all other properties	DoP as limit values (1 test result)
--	-------------------------------------

7.6.4 Actions in the case of non-conformity

Identified cases of non-conformity are:

- a) defects that have been revealed by the Certification Body in the factory production control process/measurements;
- b) the manufacturer has not met his commitments of the routine inspection, thus preventing the Certification Body from performing its surveillance tasks properly;
- c) a product tested has failed to achieve the declared value.

In the case of non-conformity, the following actions are required:

In the case of a) or b) the Certification Body shall ask the manufacturer to rectify the non-conformity and to report within a period set by the Certification body – normally not more than four weeks. The Certification Body shall take further action depending on the particular circumstances. Such activities may include extraordinary inspection, in particular after a non-conformity found at a routine inspection, or the Certification Body may accept documentary evidence that the fault has been rectified. If such a rectification is not documented, the KEYMARK Certificate will be withdrawn.

In the case of c) a representative of the Certification Body shall take samples of the Product/Property group concerned within 6 weeks and retest all relevant characteristics without delay for this particular product. For thermal resistance and thermal conductivity, the manufacture can choose between

- Retest of one sample and assessed as a limit value or
- simplified statistical procedure
 - For thermal insulation products for Buildings according EN 13172 Annex F (4 test results). During the resampling 4 samples with different production dates or dimensions shall selected.
 - For thermal insulation products for Building equipment and industrial installations according EN ISO 13787. During the resampling 3 samples with different production dates or dimensions shall selected

If retesting shows conformity with the product standard, the product shall be considered to have passed. If the product fails again in one of the follow up tests, it is deemed to have failed, see section 7.9.4.2.

The table 2 shows the principle of evaluation of test results in case of non-conformity during surveillance and the recommended number of samples.

	INSULATION KEYMARK Scheme	Revision: 2.1 Date: 2019-09-23 Page: 16 of 28
---	------------------------------	---

Table 2: Principle of evaluation of test results in case of non-conformity during surveillance

Insulation KEYMARK Certification	Product Certification		Group Certification
Product Group	Product by Product		Property by Property of nearly all products of the production site
Thermal insulation for	Building equipment and industrial installations	Buildings	
Recommended number of samples within 4 weeks during extra plant visit	3 samples (1 λ test) (1+2) for EN ISO 13787	a) 1 sample per failed Product / Property Group or / and b) 4 samples for failed λ -Group for EN 13172 Annex F statistic	
Principle of evaluation for thermal conductivity	Limit value 1 test result $\lambda(9)$ and EN ISO 13787 10% rule 2 extra $\lambda(9)$ mean of 3 $\lambda(9)$	a) Limit Value (1 test result) if failed again certificate withdrawn or new Initial Testing b) 4 λ test results for EN 13172 Annex F statistic, if failed again certificate withdrawn or re-grouping (determination of $\lambda_{90/90}$ including 4 λ and at least 6 from manufacturer with new sample)	
Principle of evaluation for other properties	Retesting of every declared values. DoP as Limit values (1 test result)		

NOTE In some cases for insulation products for building equipment and industrial installations, with test results minor exceeded, the Certification Body can reduce the retested properties as following: If characteristics by nature of the product are not influenced (no expected change in the declared value) by changes in the characteristics that failed, those characteristics may not be retested

7.6.5 Extraordinary inspection

Extraordinary inspections shall be carried out:

- in the case of non-conformity (section 7.6.4);
- after production line/unit has been idle for a period of more than 6 months;
- because of a significant change in the factory production control procedure, or process or product;
- at the request of a third party with the agreement of the Certification Body and the manufacturer.

The scope, type, and timing of an extraordinary inspection will depend on the particular circumstances (e.g. product concerned and/or production conditions).

	INSULATION KEYMARK Scheme	Revision: 2.1 Date: 2019-09-23 Page: 17 of 28
---	------------------------------	---

7.7 Fees

The scheme rules foresee a fee system to cover license fees and the operating cost of the secretariat involved. The fee system is specified in Appendix E.

Costs covering testing, inspection and assessment between manufacturer and third parties are not governed by the scheme rules, but are negotiated by the contracting parties.



7.8 Flow chart

Figure 1 shows a flow chart for the Initial Testing procedure to grant the KEYMARK

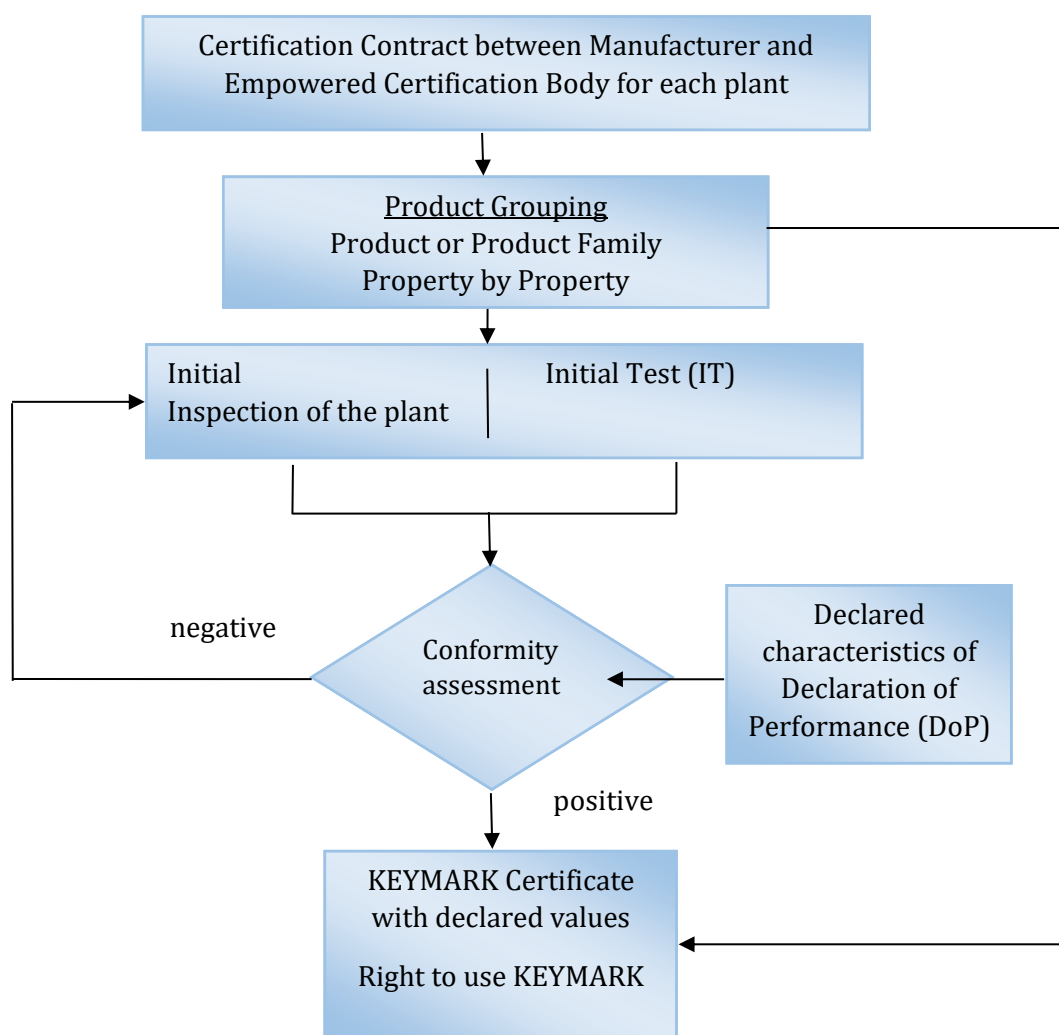


Figure 1: The Certification System (Initial Testing)

Figure 2 shows a flow chart for the Annual Surveillance.

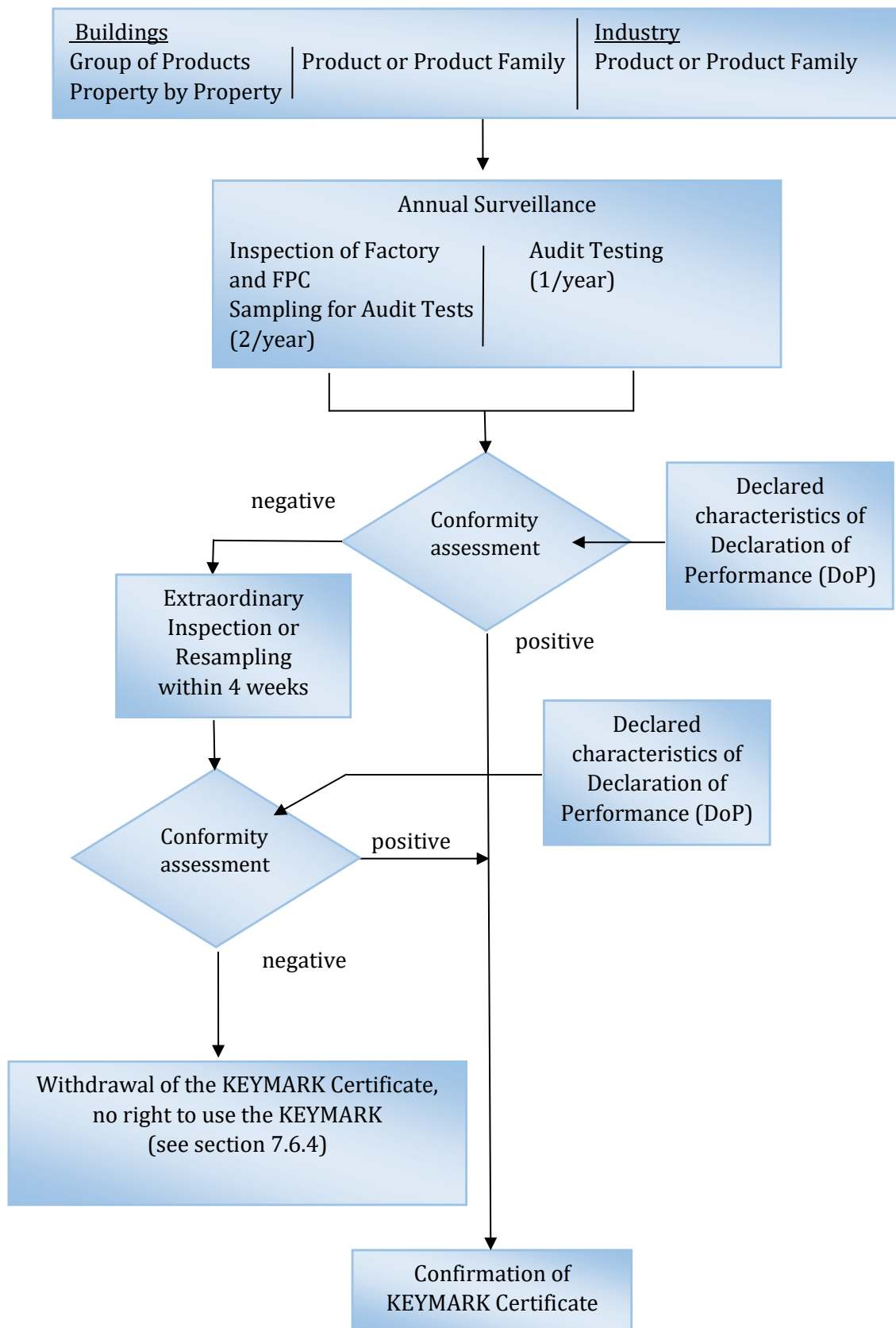


Figure 2: The Certification System (Annual Surveillance)

	INSULATION KEYMARK Scheme	Revision: 2.1 Date: 2019-09-23 Page: 20 of 28
---	------------------------------	---

7.9 Conformity mark (KEYMARK)

7.9.1 General

KMO, on behalf of CEN, grants to its national member bodies and its affiliates having published the relevant product standards, the right to license the KEYMARK.

After decision of the KMO on the empowerment of a Certification Body the relevant CEN National Member Body or CEN-Affiliate as licensee of CEN pursuant to a license agreement shall conclude a contract with this Certification Body.

Formal application for the granting of a license to use the KEYMARK is made through the signing of a contract between the manufacturer and the chosen Certification Body which sets their relationship, with respect to the implementation of the KEYMARK system for the product(s) concerned.

Only those applicants having obtained a license to affix the KEYMARK by means of the procedures laid down in the CEN/CENELEC Internal Regulations shall be entitled to use the KEYMARK.

For each product where conformity has been established:

- the manufacturer is entitled to use the conformity mark as soon as the KEYMARK Certificate has been issued by the certification body;
- the validity of the certification scheme shall be confirmed every year;
- the manufacturer is no longer entitled to use the conformity mark, if the KEYMARK Certificate is withdrawn for any reason;
- the manufacturer is not entitled to make any published statement to the effect that he has 'applied for conformity mark' for a product.

NOTE This mark should not be confused with the CE marking.

7.9.2 KEYMARK Certificate

When the factory unit and the product have passed the Initial Inspection and Initial Testing, the Certification Body shall issue a KEYMARK Certificate for the product. The KEYMARK Certificate is valid for 2 years from date of issue. Companies need to maintain certification by continuously fulfilling the requirements of the scheme. The use of the KEYMARK Certificate can be discontinued according to the contractual relation with the certification body.

Each Product or Product Group (Product by Product) covered by the certification contract shall have its own unique identifier in the form of the manufacturer's commercial product name and/or code that appears on the product at the point of sale, and can only be assigned to a **KEYMARK Product Certificate**. A KEYMARK Product Certificate may cover also a product produced in different plants if all requirements of the KEYMARK Certification procedure are fulfilled for the relevant product in every plant.

At least nearly the whole production, grouped Property by Property, shall be covered by a **KEYMARK Group Certificate**. A KEYMARK Group Certificate shall not cover products that comply with different product standards as presented in section 2. A KEYMARK Group Certificate may cover products from different production units, lines and plants.

NOTE This KEYMARK Certificate should not be confused with the CERTIFICATE OF CONSTANCY OF PERFORMANCE granted under CE marking requirements.

	INSULATION KEYMARK Scheme	Revision: 2.1 Date: 2019-09-23 Page: 21 of 28
---	------------------------------	---

7.9.3 Labelling

All approved products listed under this Scheme shall be marked with a label to confirm that the product has been tested and certificated in accordance with the requirements of this Scheme document. See below for details and CEN/CENELEC Internal Regulations Part 4. The manufacturer shall use the KEYMARK only in accordance with the Certification Body's instructions and the KEYMARK scheme. An example of a Certification Mark that can be used for this Scheme is as follows:



xxx-000

Where 'xxx' is the identification code of the involved Empowered Certification Body and "000" is the specific KEYMARK Certificate number

7.9.4 Withdrawal of KEYMARK Certificate

In case of withdrawal of a KEYMARK Certificate, the certification body shall inform the manufacturer about this and publish the information in an appropriate way.

Factory production control failure

If an extraordinary inspection, performed in response to cases a) or b) of section 7.6.4, has not been passed, or the manufacturer has, in spite of the procedures in accordance 7.6.4, not met the requirements, the certification body shall withdraw all KEYMARK Certificates issued for the entire production under this certification scheme.

Product failure

If a product has not passed the retesting performed in response to case c) of section 7.6.4, the certification body shall withdraw the KEYMARK Certificate for the product group represented by the failed product tested without delay.

A full Initial Test is not needed in case of withdrawal of the KEYMARK Certificate for a product group where some of the products in the group (with unchanged declaration) are re-submitted for certification as a new group within two months. The Initial Test shall consist of only one test result of the characteristics subject to audit testing for the product.

7.10 Website

The KEYMARK website is the place where up to date information is found including product data of certified products. It allows a paper free system to an advanced extent. Papers that will remain, such as print outs of KEYMARK certificates, will refer to the web site as the only up to date information.

As the web site only includes official information it is open for public.

The official information on the web site(s) as registered by the QAC Secretariat includes:

- The Insulation KEYMARK scheme rules
- Information on manufacturers and products as found on the product labels, but no information on grouping of products for FPC or audit testing, inspection records and test results.

	INSULATION KEYMARK Scheme	Revision: 2.1 Date: 2019-09-23 Page: 22 of 28
---	------------------------------	---

- Lists of names and addresses for Empowered Certification Bodies and Registered testing laboratories can be found on the web site, but information on the relationship between Empowered Certification Bodies and test results from comparative testing among laboratories shall not be published.

The layout of the web site and updating of pure text (e.g. scheme rules, announcements) and the list of Empowered Certification bodies and Registered testing laboratories is the responsibility of the QAC Secretariat.

Each certification body is responsible for continuous updating of its own part of the database.

At least once a year a general updating shall take place.

See the web site <http://www.keymark.eu> for further information.

7.11 Content of the manufacturer's application file

The manufacturer shall supply the certification body with all data necessary, including:

- Company name, address, etc.
- Business location(s): address etc.
- Place(s) of production
- Name(s) of the product
- Contact-person for the application
- Person responsible for quality management
- Person (name and function) who will later sign the contract between manufacturer and certification body
- Technical documentation:
 - product(s), together with the technical specification of the products and the general way they are produced, including the proposed declared values;
 - technical reports, if available, with the aim to show conformity with the relevant product standard
 - technical data, derived from FPC, with the aim to show conformity with the standard
 - the FPC (Factory Production Control)-scheme
 - production units (lines), one or more, on which the products are made including means of traceability
- If available, a copy of the EN ISO 9001 series certificate(s)
- If available, information on existing test work undertaken by the notified body with the purpose of showing compliance with the CPR. This test work may be taken into account.
- Proposed inspection/testing body(ies) (optional)

	INSULATION KEYMARK Scheme	Revision: 2.1 Date: 2019-09-23 Page: 23 of 28
---	--	--

NOTE should a producer ask for this, and this is normal the case, the certification body shall supply him in advance of the application with all data necessary for his information including:

- the application form
- a reference to the list of standards
- a copy of the KMO certification scheme rules
- a guide outlining the procedure, the estimated costs of the pre-certification tests and the current fee.

8 Rules for complaints, disputes and appeals

8.1 Complaints about certified products

Complaints about certified products may be lodged with the manufacturer or with the certification body concerned, or with the Quality Assurance Secretariat. In the latter case a copy of the complaint is also sent to the relevant certification body.

The manufacturer of certified products shall:

- keep a record of all complaints relating to a product's compliance with requirements of the relevant European standard and the manufacturer's performance declaration and make these records available to the empowered organisation when requested;
- take appropriate action in respect of such complaints and any deficiencies found in products or services that affect compliance with the requirements for certification;
- document the actions taken.

The certification body shall ensure that the manufacturer investigates complaints as soon as possible and, where appropriate, advice the complainant of the outcome.

If the investigations of the certification body reveal non-compliance with the requirements of the relevant European standard or these scheme rules, the action arising from the investigation of this complaint is notified by the certification body in a registered letter to the manufacturer

8.2 Complaints about certification bodies

Complaints regarding the actions of a certification body may be lodged with the certification body concerned, or with the Quality Assurance Secretariat. In the latter case a copy of the complaint is also sent to the relevant certification body. The certification body shall deal with the complaint using its own complaints procedure, in accordance with the principles laid down in EN ISO/IEC 17065. The Quality Assurance Secretariat shall be informed of the complaint and of the outcome and react if needed

8.3 Disputes about test results

Disputes regarding test results should be addressed to the certification body responsible for the placing of the test work with the laboratory involved. The certification body shall deal directly with the testing laboratory involved using the complaints procedure of the certification body, in accordance with the principles laid down in EN ISO/IEC 17065.

In the event that a challenge of test results cannot be resolved, e.g. by comparative testing in the presence of the two disputing parties, the arbitration procedure shall be followed.

8.4 Test result arbitration procedure.

The certification body shall take samples as required preferably from the original production in question. Test specimens from the sample shall be tested for the property in dispute at an agreed 2nd registered laboratory in the presence of both the manufacturer and the certification body. The number

	INSULATION KEYMARK Scheme	Revision: 2.1 Date: 2019-09-23 Page: 24 of 28
---	------------------------------	---

of test specimens tested shall be agreed between parties (e.g. large enough to enable a statistical comparison with the original results). A comparison shall be made between the test results obtained by the initial registered laboratory and the results obtained by the 2nd registered laboratory to detect variations or to confirm similarity (if statistics are used the population shall be the same at a confidence level relevant for the test). If the second results are seen to be from the same population, the original results will be upheld, even where the result changes the pass/fail assessment.

In the event that the results obtained by the 2nd registered laboratory cannot be confirmed as from the same population as the original results, the results obtained by the 2nd registered laboratory in the presence of both the manufacturer and the certification body shall be used.

Both the manufacturer and the certification body shall have access to the test results from the 2nd laboratory and details of the test procedures used, to enable both parties to investigate any possible non-conformity within their respective systems, and take the appropriate corrective actions.

8.5 Appeals

8.5.1 Appeal to a Certification Body

The manufacturer may lodge an appeal with the certification body to whom he addressed an application for the right to use the KEYMARK. The certification body for that purpose maintains its own appeal procedure, in accordance with the principles laid down in EN ISO/IEC 17065.

The appeal does not suspend the decision against which it is made.

Appeals can only be related to the certification process carried out by, or under the responsibility of the certification body.

An appeal should be lodged, by registered letter, with the certification body within one month of the formal notification of the contested decision. The certification body shall formally give its answer within one month of receipt of the appeal

8.5.2 Appeal to the Quality Assurance Secretariat

Manufacturers may lodge an appeal directly with the Quality Assurance Secretariat in the following cases:

- when an appeal is rejected or in case of lack of response by the certification body;
- If the appeal is in respect of the interpretation of the principles contained in this document.

The appeal procedure does not suspend the decision against which it is made. It shall be notified to the Quality Assurance Secretariat by registered letter, within one month of the formal notification of the contested decision.

In the event of an appeal being addressed by the manufacturer to the Quality Assurance Secretariat, the secretariat prepares a decision within one month of receipt. The decision is formally notified to the manufacturer and to the certification body by the secretary. The Quality Assurance Secretariat may ask for possible expert assistance/advice by its choice depending on the actual case

	INSULATION KEYMARK Scheme	Revision: 2.1 Date: 2019-09-23 Page: 25 of 28
---	------------------------------	---

9 Overview of the Insulation KEYMARK System

<u>Insulation KEYMARK Certification</u>	<u>Product Certification</u>	<u>Group Certification</u>	
Product group	Product or Product Family	Property by Property of nearly all products of the production site	
KEYMARK Certificate	Valid for 2 years with annual confirmation or annual issuing		
Examples of intended uses of thermal insulation	<u>Industry and Building Equipment</u>	<u>Buildings</u>	
	<u>Buildings</u> only if agreed on and the requirements for Product Certification are fulfilled		
Smallest Unit for Grouping and Sampling	<u>Product Line</u> : FPC <u>Factory</u> : Initial Testing and Audit Tests	<u>Production Line</u> : Initial Testing and FPC <u>Factory</u> for annual Audit Tests	
Certification Body	Empowerment by KEYMARK Management Organization		
Inspection Body	The body shall have experience of 5 years, the inspector 2 years		
Testing body	Notification for product and testing standard needed, registered lab with a valid certificate (See Appendix procedure of registration)		
License fees (CCB/Secretariat)	Per manufacturer as legal entity for each product type/sub-type (Appendix E)		
<u>Keymark Initial Testing (IT)</u>	All declared properties of 4 test results per Product group. For new products (not only a new name for marketing reason) only 2 test results for all declared properties grouping in existing Product groups. Exception only one test result for: RtF, ST(+), ST(-), $\lambda(9)$ for flat products, Compressive Creep		
Historical data for IT	Independent sampling, registered lab testing, 3 years back		
<u>Annual Audit Tests</u>	One test result for all declared properties of a Product or Product Family 1/year	One test result for all declared values, steps and levels of the Property Groups 1/year	
	Exception RtF every second year, Compressive Creep frequency acc. to relevant product standard, no audit tests for Sound absorption and special characteristics without FPC requirements		
Conformity Assessment	Declared values of DoP as limit values (also R_D and/or λ_D)		
Thermal insulation for	<u>Building equipment and industrial installations</u>	<u>Buildings</u>	
Sampling (number of samples)	3 samples (see below) of Product or representative of Product Family, one test result of each declared property	1*)	Sampling Plan to cover all Property Groups under consideration of critical representatives with one test result
Evaluation of Thermal Conductivity	Limit value 1 test result $\lambda(9)$ and EN ISO 13787 10% rule, 2 extra $\lambda(9)$ mean of 3 $\lambda(9)$	Limit value 1 test result	

	INSULATION KEYMARK Scheme	Revision: 2.1 Date: 2019-09-23 Page: 26 of 28
---	------------------------------	---

Evaluation of other properties	Limit value, 1 test result	
<u>Insulation KEYMARK Certification</u>	<u>Product Certification</u>	<u>Group Certification</u>
Product group	Product by Product	Property by Property of nearly all products of the production site
Thermal insulation for	<u>Building equipment and industrial installations</u>	<u>Buildings</u>
In case of <u>Non Conformity</u> during first Audit testing	Retesting of every declared value (with exceptions, see 7.6.4)	
Extra plant visit for sampling within 4 weeks	3 samples (see below) Product or representative of Product Group, one test result of each property	a) 1 sample per failed Product / Property Group or / and b) 4 samples for failed λ -Group for EN 13172 Annex F statistic
Evaluation of Thermal Conductivity	Limit value 1 test result $\lambda(9)$ and EN ISO 13787 10% rule, 2 extra $\lambda(9)$ mean of 3 $\lambda(9)$ if failed again certificate withdrawn or re-grouping $\lambda(9)$	c) 1 test result as limit value, if failed again certificate withdrawn or new Initial Testing d) 4 λ (EN 13172 Annex F statistic) if failed again certificate withdrawn or re-grouping (determination of $\lambda_{90/90}$ including 4 λ and at least 6 from manufacturer with new sample)
Evaluation of other properties	Limit value, 1 test result, if failed again certificate withdrawn or new Initial Testing	

*) If the manufacture of building insulation uses the Product Certificate instead of the Group Certificate, then only one sample is needed

	INSULATION KEYMARK Scheme	Revision: 2.1 Date: 2019-09-23 Page: 27 of 28
--	------------------------------	---

Annex A

Requirements for comparative checking of manufacturers equipment for thermal conductivity measurement used in FPC

EN 13172:2012, Clause 5.4.2, table 1, requires that the calibration of the manufacturers test equipment for thermal properties shall include a comparison of test results obtained by the manufacturer with those obtained by a Registered Laboratory on the same sample. The reference test sample to be used is the IRMM440 defining the European thermal conductivity level. The procedure to be followed for the purposes of this scheme is described in this annex. The procedure works only with products which don't age, are not hygroscopic or loose fill.

For the comparison the manufacturer shall be provided with access to test specimens taken from the sample selected by the representative of the Certification Body, either before, or by return of the test specimens to the manufacturer subsequent to the Registered Laboratory having their testing conducted. Access to the test specimens shall be carefully controlled by the Certification Body to ensure that the condition of the test specimens and the traceability is maintained. Wherever possible the same test specimens, prepared for the purpose of measuring thermal properties, shall be used by both parties at the same measurement thickness. Sampling shall be within the manufacturers declared product groupings.

NOTE If the comparison result is obtained before the Registered Laboratory has its testing conducted, the test result obtained using the manufacturer's equipment may be included in the FPC.

The normal process shall be:

a)

- testing of the test specimens at the Registered laboratory of the Certification Body;
- return of the test specimens to the manufacturer;
- testing of the test specimens with the manufacturer's equipment.

or b)

- testing of the test specimens selected by the representative of the Certification Body with the manufacturers equipment;
- testing of the test specimens at the Registered laboratory of the Certification Body.

The manufacturer or the Registered Laboratory, by agreement, shall retain the test specimens from at least the last 6 compared results used to determine the variance within each product family

The calibration of each item of equipment used for FPC shall be maintained. Comparison by procedure a) or b) above may be applied to only one item of manufacturer's equipment, hereafter called "the manufacturer's reference equipment", provided there is evidence of a documented calibration procedure in use to compare the results obtained from all of the equipment used for FPC, with those of the manufacturer's reference equipment. The manufacturer's reference equipment may be located at the production site, in a central laboratory, or in a subcontracted independent laboratory used for the manufacturer's FPC.

NOTE Where a manufacturer has one reference equipment for several production sites, or has more than one testing laboratory for product certification, procedure a) or b) may be applied to the reference equipment only. The manufacturer must however apply the procedure separately for each of the Certification Bodies.

	INSULATION KEYMARK Scheme	Revision: 2.1 Date: 2019-09-23 Page: 28 of 28
--	------------------------------	---

For each equipment subjected to comparison, the range of product groups compared, shall be at least the same as the audit samples selected by the representative of the Certification Body from that location within any audit year, with a minimum of three comparisons for each product family. The mean of the difference (%) between the manufacturers results and the Registered laboratory results for each product family, in any one (1) year period, shall be within $\pm 1,5 \%$ ¹.

In the case of products subject to thermal ageing or hygroscopic or loose fill, the test specimen preparation for comparative testing shall be agreed between the manufacturer and the Registered laboratory in accordance with requirements of the relevant product standard.

If the deviation between the manufacturer and the registered (notified) laboratory is larger than 1.5 % a detailed evaluation shall be performed of

- The manufacturer's calibration procedure, results and actions
- The manufacturer's internal checks (measurements) –both regarding regularity and stability of results; see EN 13172:2012 clause 5.4.2, table 1

and if relevant

- The status of the calibration and internal checks for the Registered laboratory

If no clear conclusion whether the manufacturer is measuring correctly within $\pm 1.5 \%$ of the European lambda level can be reached or not, and hereby the results being accepted or not, the Expert group shall be consulted.

- Advice from the Expert Group may be requested by the Certification body.

NOTE Where the same test specimen cannot be measured at both points because of the size of the test equipment, the central section of the test specimen should be used in the smaller equipment.

¹ This value is subject to evaluation by the SDG-5 and the Expert Group