



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

Revision: 2.1
(2019-09-23)

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

Foreword

This VDI 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).

Revision of INSULATION VDI 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.....	6
4 References.....	6
5 Quality Assurance Committee (QAC) – Scheme-Development-Group 5 (SDG-5).....	7
6 Definitions.....	7
7 Certification System.....	8
7.1 Common acceptance of conformity assessment procedures and results.....	8
7.2 General.....	9
7.3 Product Grouping.....	9
7.4 Factory Production Control (FPC).....	10
7.5 Initial Inspection and Initial Testing (IT).....	10
7.6 Surveillance procedures.....	12
7.6.1 Inspection and surveillance of the factory and Factory Production Control.....	12
7.6.2 Audit testing.....	12
7.6.3 Evaluation of test results.....	13
7.6.4 Actions in the case of non-conformity.....	13
7.6.5 Extraordinary inspection.....	15
7.7 Fees.....	15
7.8 Flow chart.....	16
7.9 Conformity mark (VDI-mark).....	18
7.9.1 General.....	18
7.9.2 VDI Certificate.....	18
7.9.3 Labelling.....	18
7.9.4 Withdrawal of VDI Certificate.....	19
7.10 Website.....	19
7.11 Content of the manufacturer’s application file.....	20
8 Rules for complaints, disputes and appeals.....	21
8.1 Complaints about certified products.....	21
8.2 Complaints about certification bodies.....	21
8.3 Disputes about test results.....	21
8.4 Test result arbitration procedure.....	21
8.5 Appeals.....	22
8.5.1 Appeal to a Certification Body.....	22
8.5.2 Appeal to the Quality Assurance Secretariat.....	22
9 Overview of the Insulation VDI System.....	23

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

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

Consequently, the VDI-mark 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.

Insulation products carrying the VDI must have a significantly positive energy balance: This means the reductions in energy used and emissions produced during the service life of a VDI 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 VDI 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.

	<p style="text-align: center;">INSULATION VDI Scheme</p>	<p>Revision: 2.1 Date: 2019-09-23 Page: 5 of 23</p>
---	--	---

2 Scope

These Specific VDI 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 building equipment and industrial installations

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*

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*

	<p style="text-align: center;">INSULATION VDI Scheme</p>	<p>Revision: 2.1 Date: 2019-09-23 Page: 6 of 23</p>
---	--	---

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 VDI)

QAC Quality Assurance Committee

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*

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*

	<p style="text-align: center;">INSULATION VDI Scheme</p>	<p>Revision: 2.1 Date: 2019-09-23 Page: 7 of 23</p>
---	--	---

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 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 VDI – Fees*

Appendix F, *Product Grouping Examples*

Appendix G, *Minimum content of the VDI Certificate*

Appendix H, *VDI scheme rules for products where no EN standard exist (Not related to 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 extension of the VDI scheme shall be managed in a specific Appendix H.

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 can also act in the VDI certification system if the relevant product standard is covered.

Registered laboratory

Fulfils the requirements of the Scheme, has a valid registration of the QAC 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.

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

	<p style="text-align: center;">INSULATION VDI Scheme</p>	<p>Revision: 2.1 Date: 2019-09-23 Page: 8 of 23</p>
---	--	---

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 VDI Certificates 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 Certificate for the grouped products can be issued if all declared Property Groups are tested positive (only the Reaction to Fire can be grouped by property).

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 VDI certification body so as to certify the declared values of a product according the VDI procedures. As such the certified organisation is responsible for bringing the VDI-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 VDI 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 VDI 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.

	<p style="text-align: center;">INSULATION VDI Scheme</p>	<p>Revision: 2.1 Date: 2019-09-23 Page: 9 of 23</p>
---	--	---

7.2 General

The VDI 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 VDI Certificates
- Annual Tasks (once the VDI 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 VDI 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 VDI 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 EN 13468, EN 12667, EN 12939, EN ISO 8497 and/or EN 14706 / EN 14707 for thermal insulation products for building equipment.

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 VDI 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 VDI-mark, the manufacturer shall measure, calculate, and declare the characteristic per group/product according its testing plan per line/per unit as part of the FPC. The manufacturer shall also document the influences of the

	<p style="text-align: center;">INSULATION VDI Scheme</p>	<p>Revision: 2.1 Date: 2019-09-23 Page: 10 of 23</p>
---	--	--

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 VDI-certification, of the audit testing (per location)
- The manufacturer shall be careful in grouping the products, especially to prevent non-conformity results coming out from the 3rd party activities and can lead to the withdrawal of the VDI 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 products 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 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 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 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

	<p style="text-align: center;">INSULATION VDI Scheme</p>	<p>Revision: 2.1 Date: 2019-09-23 Page: 11 of 23</p>
---	--	--

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 initial 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
- 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 VDI 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 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.

	<p style="text-align: center;">INSULATION VDI Scheme</p>	<p>Revision: 2.1 Date: 2019-09-23 Page: 12 of 23</p>
---	--	--

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.

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,
- 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 VDI Certification	Product Certification
Product Group	Product by Product
Thermal insulation for	Building equipment and industrial installations
Recommended number of samples	3 samples (1 λ test) (1+2) for EN ISO 13787
Principle of evaluation for thermal conductivity	Limit value, 1 test result $\lambda(\vartheta)$ and EN ISO 13787 10% rule, 2 extra $\lambda(\vartheta)$, mean of 3 $\lambda(\vartheta)$ DoP as limit $\lambda(\vartheta)$
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

	<p style="text-align: center;">INSULATION VDI Scheme</p>	<p>Revision: 2.1 Date: 2019-09-23 Page: 14 of 23</p>
---	--	--

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 VDI Certificate will be withdrawn.

In the case of c) a representative of the Certification Body shall take samples of the Product 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 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 VDI Scheme	Revision: 2.1 Date: 2019-09-23 Page: 15 of 23
---	--------------------------	---

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

INSULATION VDI Certification	Product Certification
Product Group	Product by Product
Thermal insulation for	Building equipment and industrial installations
Recommended number of samples within 4 weeks during extra plant visit	3 samples (1 λ test) (1+2) for EN ISO 13787
Principle of evaluation for thermal conductivity	Limit value, 1 test result $\lambda(\vartheta)$ and EN ISO 13787 10% rule, 2 extra $\lambda(\vartheta)$, mean of 3 $\lambda(\vartheta)$
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).

7.7 Fees

The scheme rules foresee a fee system to cover 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 VDI-mark

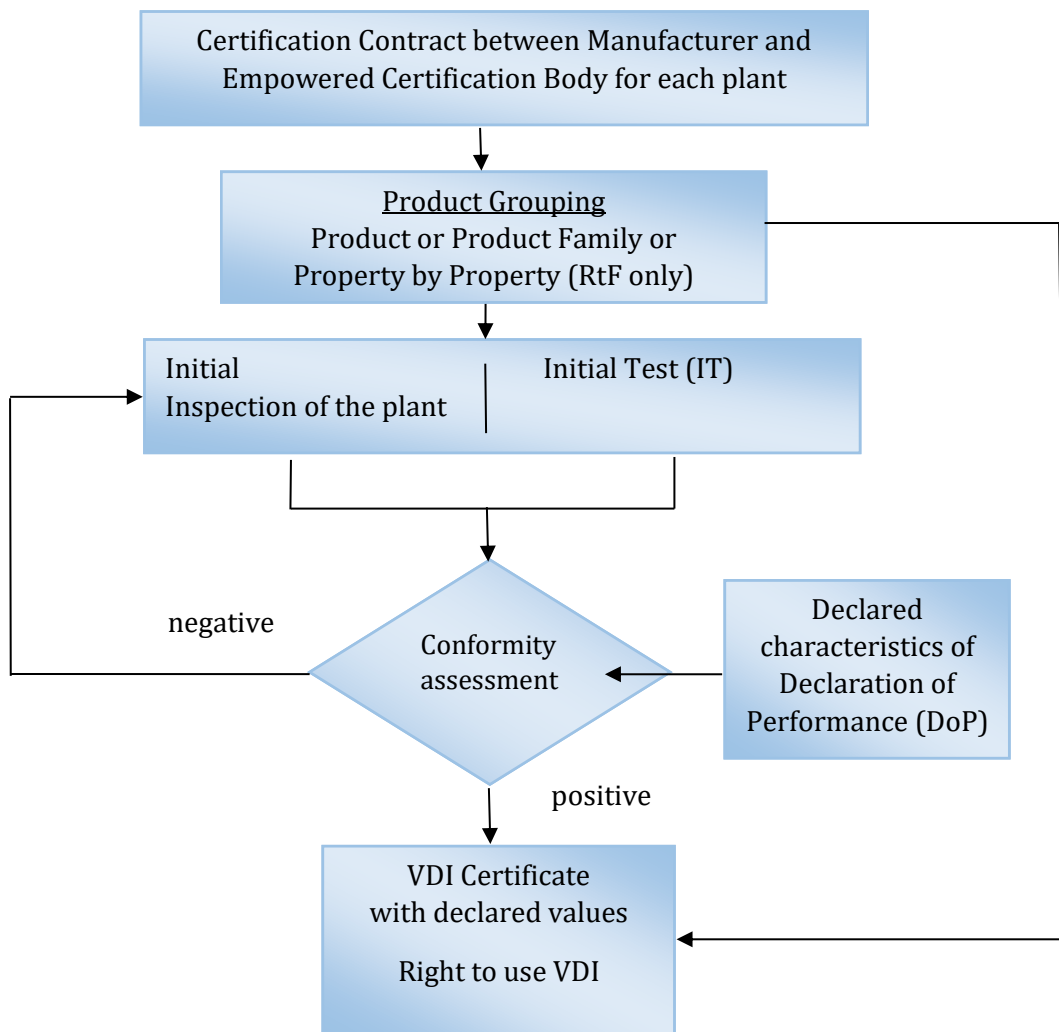


Figure 1: The Certification System (Initial Testing)

Figure 2 shows a flow chart for the Annual Surveillance.

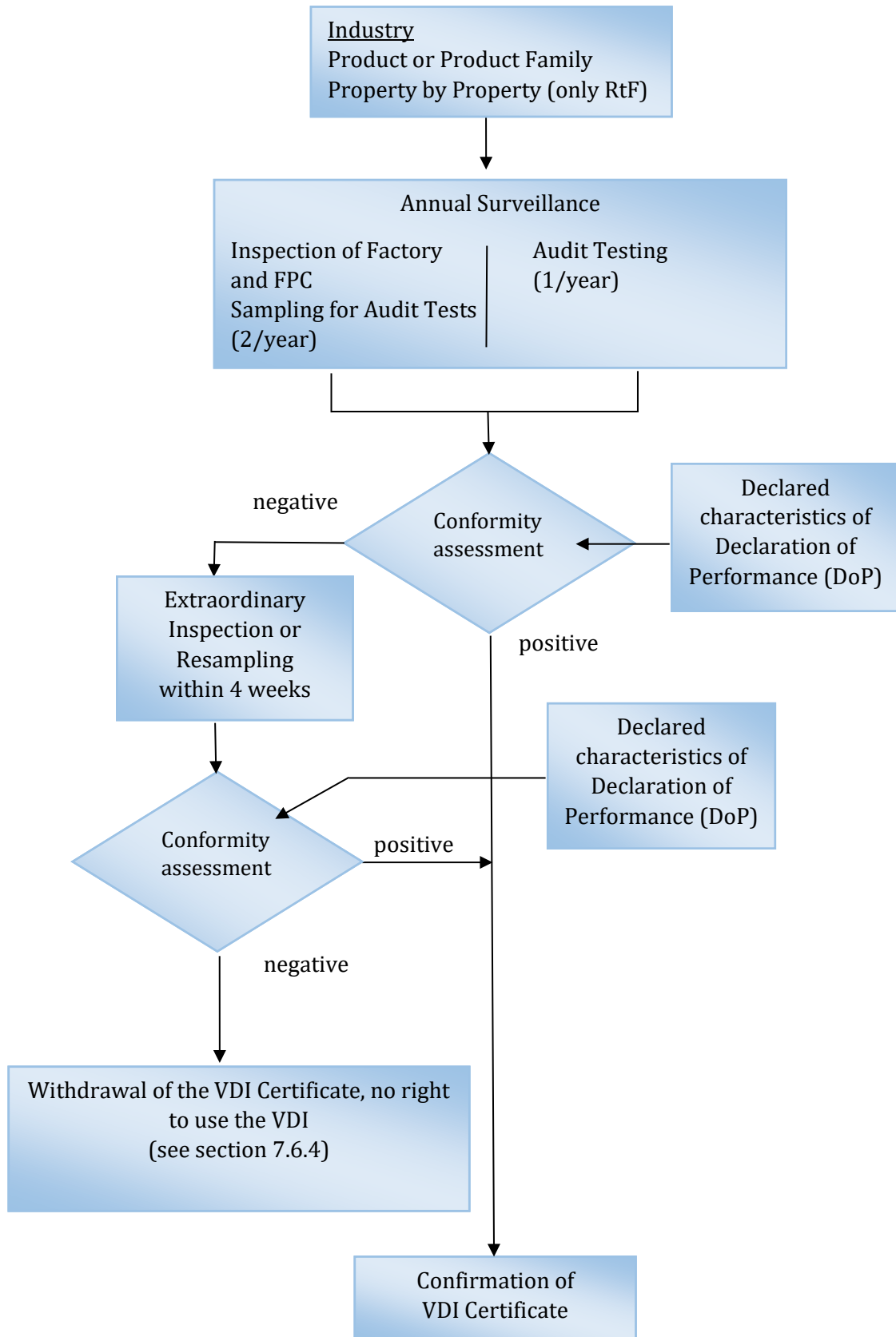


Figure 2: The Certification System (Annual Surveillance)

	INSULATION VDI Scheme	Revision: 2.1 Date: 2019-09-23 Page: 18 of 23
---	--------------------------	---

7.9 Conformity mark (VDI-mark)

7.9.1 General

Formal application for the granting of a license to use the VDI-mark 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 VDI system for the product(s) concerned.

Only those applicants having obtained a license to affix the VDI-mark shall be entitled to use the VDI-mark.

For each product where conformity has been established:

- the manufacturer is entitled to use the conformity mark as soon as the VDI 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 VDI 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 VDI Certificate

When the factory unit and the product have passed the Initial Inspection and Initial Testing, the Certification Body shall issue a VDI Certificate for the product. The VDI 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 VDI Certificate can be discontinued according to the contractual relation with the certification body.

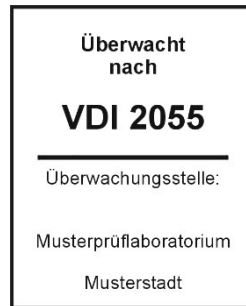
Each Product or Product Group (Product by Product) covered by the certification contract shall have its own unique identifier in the form of the manufacturer’s commercial product name and/or code that appears on the product at the point of sale, and can only be assigned to a **VDI Product Certificate**.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

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

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. The manufacturer shall use the VDI-mark only in accordance with the Certification Body’s instructions and the VDI scheme. An example of a Certification Mark that can be used for this Scheme is as follows:

	<p style="text-align: center;">INSULATION VDI Scheme</p>	<p>Revision: 2.1 Date: 2019-09-23 Page: 19 of 23</p>
---	--	--



7.9.4 Withdrawal of VDI Certificate

In case of withdrawal of a VDI 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 VDI 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 VDI 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 VDI 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 VDI 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 VDI 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 VDI 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.
- 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.

	<p style="text-align: center;">INSULATION VDI Scheme</p>	<p>Revision: 2.1 Date: 2019-09-23 Page: 20 of 23</p>
---	--	--

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)

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.

	<p style="text-align: center;">INSULATION VDI Scheme</p>	<p>Revision: 2.1 Date: 2019-09-23 Page: 21 of 23</p>
---	--	--

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 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.

	<p style="text-align: center;">INSULATION VDI Scheme</p>	<p>Revision: 2.1 Date: 2019-09-23 Page: 22 of 23</p>
---	--	--

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 VDI-mark. 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 VDI Scheme	Revision: 2.1 Date: 2019-09-23 Page: 23 of 23
---	--------------------------	---

9 Overview of the Insulation VDI System

<u>INSULATION VDI Certification</u>	<u>Product Certification</u>
Product group	Product or Product Family
VDI Certificate	Valid for 2 years with annual confirmation or annual issuing
Intended uses of thermal insulation	<u>Building equipment and industrial installations</u>
Smallest Unit for Grouping and Sampling	<u>Product Line</u> : FPC <u>Factory</u> : Initial Testing and 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>VDI Initial Testing (IT)</u>	All declared properties of 4 test results per Product. For new products (not only a new name for marketing reason) only 2 test results for all declared properties grouping in existing Product families. 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 Exception RtF every second year, Compressive Creep frequency acc. to relevant product standard, no audit tests for Sound absorption special characteristics without FPC requirements
Conformity Assessment	Declared values of DoP as limit values
Sampling (number of samples)	3 samples (see below) of Product or representative of Product Family, one test result of each declared property
Evaluation of Thermal Conductivity	Limit value, 1 test result $\lambda(9)$ and EN ISO 13787 10% rule, 2 extra $\lambda(9)$ mean of 3 $\lambda(9)$
Evaluation of other properties	Limit value, 1 test result
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 Family, one test result of each property
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 $\lambda(9)$
Evaluation of other properties	Limit value, 1 test result, if failed again certificate withdrawn or new Initial Testing