TREMPLIN ACERMI Guidelines

Characterisation of the thermal performances of products not found within the guidelines

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1 Purpose

This Product Guideline supplements the measures in the General Guidelines.

The purpose of the ACERMI guidelines is to allow access to certification for insulating products defined in § 1.1, through internal production requirements adapted to the means of manufacturers. Thus, the declared thermal performance of the product is directly modulated according to the quality of the testing conducted at the plant for ensuring the thermal performance of the product. Checking by third parties remains unchanged relative to the ACERMI guidelines based on 2 annual audits in the factory, of the samples taken on site and pilot laboratory testing, pursuant to the requirements of the *General Guidelines.*

1.1 Field of Application

These Product guidelines concern manufactured products shipped from the factory with a finished look or semi-finished, that:

- Are not covered by the existing ACERMI Product guidelines
- Are covered by a Technical Opinion, a Technical Application Document, a TAD, a Type A ATEX or yet professional rules
- Participate in enhancing the thermal performance of a work by increasing the thermal resistance by at least 0.25 m^2.K/W.

For example, the following products (non-exhaustive list) may be the object of these guidelines:

- Bulk biosourced products (e.g., cotton) other than those referred to in existing guidelines
- Vacuum packed insulating products or aerogels
- Insulating framing blocks
- Cellular concretes
- Sandwich panels with insulating core
- Synthetic fibre mattresses
- Etc.

Apertures and joineries (glazing, skylight, door, etc.) are not covered by these guidelines.

1.2 Principle

The purpose of this document is to deliver a certificate that only covers the characteristics related to the thermal aspect (thickness, thermal conductivity, thermal resistance, emissivity and compaction as the case requires).

This certificate is renewed annually in compliance with the general guidelines and has a period of validity limited to 3 years.

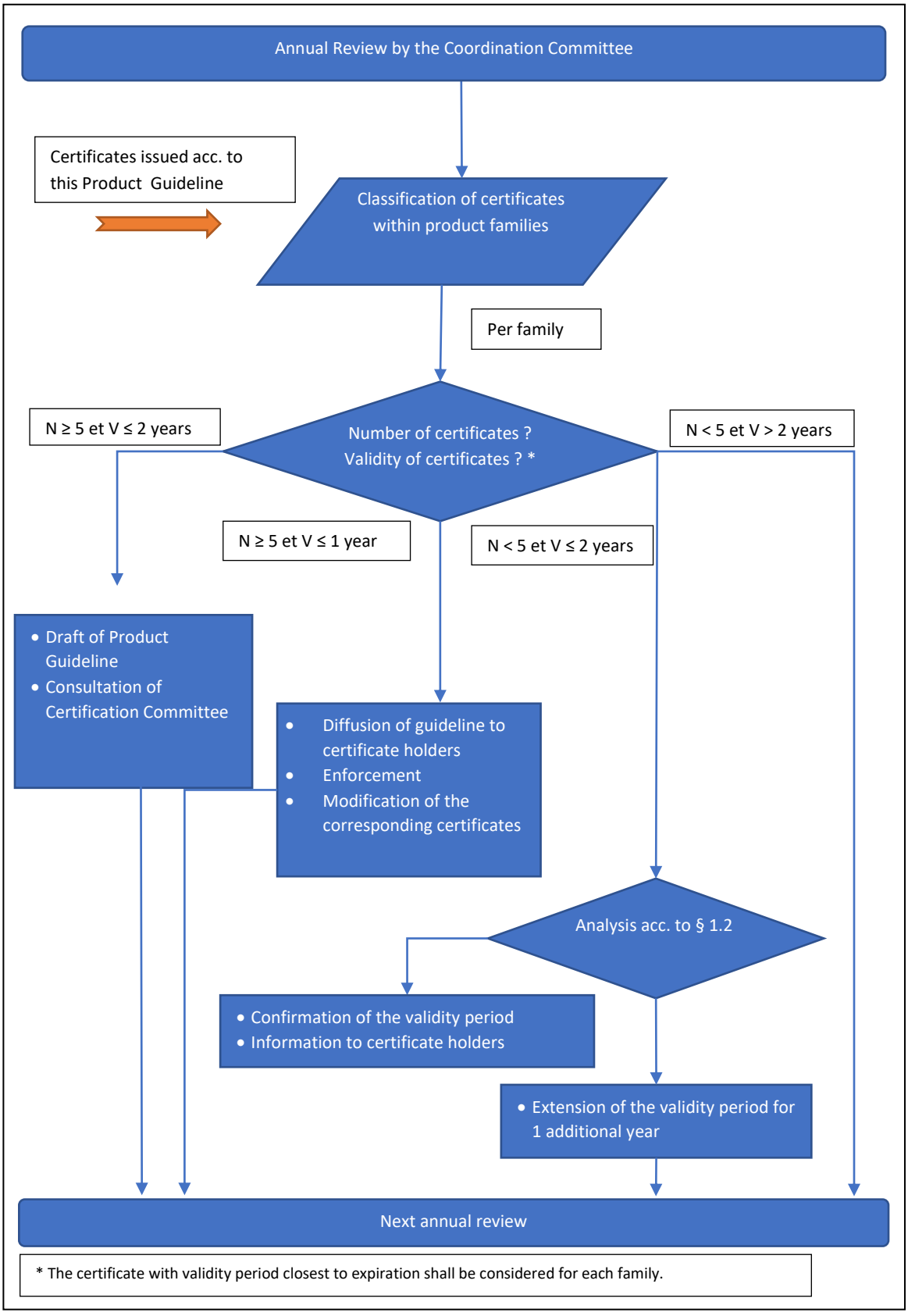
When certificates are issued on a new family, ACERMI and the manufacturers involved create a timetable over 3 years for the purpose of drafting a specific draft product benchmark by replacing the tremplin guidelines to facilitate the pursuit of certification upon expiry of the certificate. This timetable is scheduled as followed:

Certificates issued under this Product Guideline (also referred to as "Tremplin ACERMI"), still ongoing, are reviewed once a year *minimum*, by the coordination committee, following the process described on the following page.

For a product family "Tremplin ACERMI", which includes less than 5 certificates, with a remaining validity of less than 2 years, the analysis mentioned in the decision tree is performed considering the following information:

- Evolution of documents framing the fitness-for-use of the products
- Existence or absence of non-conformities in the annual thermal conductivity tests
- Non-conformities observed during the audits
- Potential claims received from users by the ACERMI Central Office
- Surveillance of the market (ACQ alerts, etc…)

The coordination committee issues an opinion, of either extension of the duration of the certificates, or confirmation of the existing duration (Note: The analysis is performed every year, leading to 2 analyses during the minimum certificate duration. The opinion issued may differ each time it is issued).



Decision tree for annual review

The certification procedure is set up so as not to exceed 4 months following receipt of the complete technical file and signature of the estimate, except for those products requiring testing that is inevitably longer (ageing, compaction) or a technical opinion instruction or DTA.

Depending upon the means available to the manufacturer, this document proposes two possible evaluation methods set forth below:

- Case No. 1: THE MANUFACTURER HAS A MEASURING DEVICE FOR THERMAL PERFORMANCES

After reviewing the file, and as required after the factory audit, pilots consider that the quality process put in place in the factory facilitates meeting the requirements of existing ACERMI Guidelines, in particular concerning monitoring frequencies and metrological fitting that are suitable for ***§ 5.1 Manufacturers with thermal performance measuring*****.**

- Case No. 2: THE MANUFACTURER DOES NOT HAVE A MEASURING DEVICE FOR THERMAL PERFORMANCES

After reviewing the file, and as required after the factory audit, there is mention of partial or total absence of means for testing on the manufacturer's site. The quality system is not capable of meeting the requirements of the existing ACERMI Guidelines.

The testing frequencies to be put in place are therefore adapted. These frequencies are thus set out in ***§ 5.2 Manufacturers that do not have devices for measuring thermal performance*****.**

2 Additional elements of the certificate technical file

The technical file defined in paragraph 2.2 of the General Guidelines is supplemented by the following items.

- Technical Opinion, Technical Application Document or type A ATEX in progress of a nature that is favourable for products not covered by a TAD or by professional rules;
- Where they exist, ATE or ETE (as well as associated CUAP, ETAG, or DEE), and elements provided under professional rules;
- Declaration of compliance with the regulatory measures, in particular with the REACH rule and EU Regulation n°528-2012 concerning the marketing of biocidal products;

The file contains information concerning the following elements:

- Nominal characteristics:
  - For products in panels or rolls: tolerances of thicknesses (these tolerances must be such that the thermal resistance is not changed by more than 0.05 m².K/W)

  - For bulk products, the requesting party must provide the thermal conductivity curve according to the mass density, over the range of the mass density concerned
- Raw materials
  - geographic origin,
  - nature and specifications (specifications regarding the crops and animal husbandry),
  - transport and storage,
  - production process,
  - treatments and adjuvants,
  - traceability of the components,
  - control programme.

Provide explicit elements concerning the quality of the geographical, temporal or technological data, i.e. the traceability of all information and the related means of verification (e.g. the geographical origin of each raw material on the delivery slip and the associated batch numbers given on the labels of the packages of this raw material delivered. This information is permanently available in the factory registers).

- Specific controls
  - Health controls conducted on the raw materials

Raw materials such as feathers, wool, etc. must possess approval notification of the company under article 18 of the regulation concerning animal by-products and must have a certificate of periodical inspection of the site delivered by the district veterinary public health authority. Notification pursuant to CE n°1774/2002 regulation of the European Parliament and Council of 3rd October 2002 establishing the sanitary regulations applicable to animal by-products not intended for human consumption and the decree of 1st September 2003 concerning verification of the activity in question.

3 Characteristics which can be certified

For products in panels and rolls, the characteristics likely to be certified are the characteristics listed below:

- Thermal resistance according to the associated thickness and tolerances
- Emissivity

In any event, the product must be in a form allowing it to be handled (can be manipulated without deterioration and can be tested with laboratory means).

For bulk products, the characteristics likely to be certified are listed below:

- Thermal conductivity
- Thermal resistance according to thickness
- Compaction

4 Methods of determination of the certified characteristics by the pilot laboratories

Prior to the certification process, each new product family shall be subject to analysis by the pilots in order to determine, *at least*:

1. The type of packaging prior to thermal testing if the thermal performances of the product change according to the level of moisture in the environment.
2. The type of ageing if the durability of the thermal performance of the product is altered over time
3. The appropriate thermal measurement method (according to technical specification 1 and 2 and §4.1)

The following elements are added for bulk products:

- The appropriate blowing method (type of machine used, procedure to be respected, etc.)
- When using specific material, the material to be implemented must be made available
- The method for measuring compaction and its use

The certification committee for the pilots' analysis is consulted.

The test methods applied by the pilot laboratory for each of the characteristics are set out in the following paragraphs.

4.1 Thermal conductivity

The measures in Technical Specification No.1 apply. Thermal conductivity shall be determined based on the thermal resistance at the thickness under consideration (§ 4.2.).

4.1.1 Sheet / panel products

4.1.1.1 Product likely to display ageing due to the presence of a propellant gas

Products containing a propellant gas that enhances their conductivity shall be subject to measurement before and after ageing. Except for special notice from the committee, 6-month ageing at 70°C is conducted with an intermediate measuring point at 3 months.

4.1.1.2 Humidity-sensitive product

See § 1.2 of Technical Specification no. 1.

4.1.1.3 Product sensitive to humid ageing (water adsorption)

Products sensitive to humid ageing must age within an enclosed space at 35°C and with 80% humidity for 50 days. Conductivity readings are conducted on aged product.

4.1.1.4 Vacuum-wrapped product

Thermal and hydrometric ageing must be carried out. Existing knowledge has the ageing conditions set at 70°C 90%RH for 6 months. Certified thermal resistance takes into account the variation related to the thermal bridges surrounding the panels. These thermal bridges shall be determined by 2 comparative readings between a complete panel and 2 panels bracketed together.

4.1.1.5 Other products

In any event, tests for sensitivity to humidity are conducted for §4.1.1.2

4.1.2 Bulk products

4.1.2.1 Bulk products (polyester, cotton, wood wool)

These products shall be treated on the basis of Product Guidelines no. 13 or 14 according to the following elements:

- sensitivity to humidity
- relation between the thermal conductivity and the density

Compaction is always measured according to technical specification no. 4.

4.1.2.2 Bulk product sensitive to humid maturation

These products shall be treated on the basis of Product Guidelines no. 14 including the compaction elements. Moreover, the conductivity reading shall be obtained on product aged within an enclosed space at 35°C and 80% humidity for 50 days.

4.2 Thermal resistance

4.2.1 Products not compressed in packaging

Thermal measurement is carried out at the thickness measured according to NF EN 823 standard.

4.2.1.1 Case of products for which 10% compression stress is greater than 10kPa

For these products, the thickness to be considered is that set under standard EN823 under a stress of 250Pa. Certified thermal resistance is defined according to the procedures in Technical Specification No.2.

4.2.1.2 Case of products for which 10% compression stress is lower than 10kPa

Notwithstanding special notice from the committee, for these products, the thickness to be considered is that set under standard EN823 under a stress of 50Pa. Certified thermal resistance is defined according to the procedures in Technical Specification No.2.

4.2.2 Products compressed in packaging

The thickness is measured according to the NF EN 823 standard and criteria set forth in § 4.2.1.1 and 4.2.1.2, after storage of the material in its packaging for 9 weeks[1].

Thermal measurement is made:

- at the nominal thickness if this latter is less than or equal to the average measured thickness,
- otherwise, at the average thickness measured.

So that the results of determination of thermal resistance by the verification body can be transmitted to the manufacturer within a reasonable period of time, these measurement and those for thickness are made independently of each other. Measurements corresponding to determination of thermal resistance are made without waiting for the storage period defined above. Thickness measurements are made on additional samples after storage. If the thickness measured is then less than the nominal thickness, the temperature readings are taken on the samples following storage.

With regard to compressed products for which there exists a renewal of the differing thickness over several days following opening of the packaging:

The accepted thickness is that measured 15 minutes after opening of the packaging. Should the manufacturer consider that a longer period is required for regaining the thickness, a maximum period of 6 hours may be used. *The manufacturer shall then provide a detailed curve showing the time required for regaining the thickness of their product.*

The product shall be thermally tested at the measured thickness once it has regained thickness if this thickness is less than the nominal thickness or else at the nominal thickness.

4.3 Emissivity

When the product displays a surface coating with thermal performance that is influenced by the emissivity, the emissivity shall be certified using the methods set forth in the Technical Specification no. 7.

5 Factory production control

5.1 Manufacturers with measuring devices for thermal performance

Production control in the production unit satisfies the requirements of the table below, according to the characteristics relevant to the target application.

In case of indirect control, it shall be correlated with the direct method.

[1] If humidity causes the mechanical characteristics to deteriorate, the packaging shall take into account 9 weeks of humidity

Table 1: Products in panels or rolls

Caracteristic	**Minimum test frequency** [a]				
	Direct test			**Indirect test**	
				Test Method	**Frequency**
Thermal resistance– Thermal conductivity	Once a day			–	–
Length and width	Rolls Once every 4 hours		Panels Once every 2 hours	Manufacturer method	Once every 2 hours
Thickness	Once every 4 hours		Once every 4 hours	–	–

Table 2: Bulk products

Parameter	**Direct Test**	**Indirect tests**	
		Test method	**frequency**
Weight of the bags (1)	All the bags	----	----
Density (2)	Once a day	----	----
Thermal conductivity and resistance	Twice a week		
Humidity level (3)	Once a week	----	----
Mechanical compaction (According to Technical Specification no. 4)	Once a day	----	----

Notes :

1. The quantity of material in a sales unit must not be less than the nominal weight of the sales unit.
2. If several applications are targeted, the tests must be performed on one type of application.
3. Determination of the humidity level of the manufactured product which has not be stabilised beforehand at equilibrium moisture content 23°C, 50% RH

5.2 Manufacturers with no measuring devices for thermal performance

Production control in the production unit satisfies the requirements of the table below, according to the characteristics relevant to the target application.

In case of indirect control, it shall be correlated with the direct method.

Table 3: Products in panels or rolls

Characteristic	**Minimum test frequency** [a]			
	Direct test		**Indirect test**	
			Test method	**Frequency**
Thermal resistance– Thermal conductivity	Once every 3 months for each product/group of products and indirect test		manufacturer method	Once an hour
Length and width	Rolls Once every 4 hours	Panels Once every 2 hours	Manufacturer method	Once every 2 hours
Thickness	Once every 4 hours	Once every 4 hours	–	–

Table 4: Bulk products

Parameter	Direct tests	Indirect tests	
		Test method	frequency
Unit mass (1):	Each unit	----	----
Density (2)	depending on the process, nature of the product, type of manufacture and sensitivity to conductivity	----	----
Thermal conductivity	Once a month and indirect tests	Manufacturer method	on the process, nature of the product, type of manufacture and sensitivity to conductivity
Humidity level (3)	Once a week	----	----

Notes :

1. The quantity of material in a sales unit must not be less than the nominal weight of the sales unit.
2. If several applications are targeted, the tests must be performed on one type of application.
3. Determination of the humidity level of the manufactured product which has not be stabilised beforehand at equilibrium moisture content 23°C, 50% RH

5.3 Complementary definitions

Moreover, the manufacturer must have at least ten thermal resistances or thermal conductivity test results corresponding to direct internal or external measurements. The direct measurements of thermal resistance or thermal conductivity must have been conducted over the last twelve months. If less than ten test results are available, this period may be extended to maximum period of three years until ten results are obtained. The product and production conditions must not have been significantly changed during this period (manufacturing stability).

For new products, the ten thermal resistance or thermal conductivity test results must come from measurements spread over a minimum period of ten days and represent at least 4 production dates. These 4 dates must cover when possible the range of thicknesses demanded.

The thermal conductivity values at fractile 90/90 must be calculated in compliance with the method described in Technical Specification No.1 and must be recalculated at intervals which must not exceed three months of production.

6 Tests performed during follow-up

For characteristics requiring monitoring, random tests are conducted twice a year according to the table below when relevant to the product in question.

The tests are conducted in accordance with the measures in paragraph 3 of this guideline, supplemented if applicable by the procedures described in the Technical Specifications corresponding to the characteristics tested.

Table 5: For product in the form of panels and rolls

Characteristics (paragraph 3)	**Test methods**	**Place of performance of the tests**
Thermal resistance – Thermal conductivity	NF EN 12667 NF EN 12939	Pilot laboratory
Length and width	NF EN 822	Production unit and pilot laboratory
Thickness	NF EN 823 or NF EN 12431	Production unit and pilot laboratory
Squaring	NF EN 824	Production unit
Flatness	NF EN 825	Production unit
Other characteristics or criteria	**Test methods**	**Place of performance of the tests**
Emissivity	Technical Specification No.7	Pilot laboratory
Density	NF EN 1602	Pilot laboratory

Table 6: For bulk product

Caracteristics (Paragraph 5)	**Test methods**	**Place of performance of the tests**
Thermal resistance – Thermal conductivity	NF EN 12667 NF EN 12939	Pilot laboratory
Weight of the sales unit		Production unit and Pilot laboratory
Other characteristics or criteria	**Test methods**	**Place of performance of the tests**
Density used (or power covering)	Standard NF EN 1602[2] + Procedure from Annexe J of standard NF EN 14064-1, with a container of a minimum size of 1m x 1m x 0,25m	Production unit and pilot blowing laboratory

The certifying body may also perform tests to verify other characteristics not listed in the table below, in particular if there is any doubt as to the compliance of the certified values.

7 Certificate maintenance rules

The certificate maintenance rules are defined in paragraph 4 of the General Guidelines.

Based on the results of the tests performed by the pilot body, product compliance is verified:

- For the dimensional characteristics

By comparison with the tolerances set forth in the manufacturer's technical file.

- For thermal performance according to paragraphs 2.1 or 2.2 of Technical Specification E

8 Marking Rules

The marking rules laid out in Technical Specification D apply.

In particular, the information label complies with the provisions of paragraph 3.1 of this Technical Specification.

[2] Density is measured on samples maintained at (23 ± 2) °C and (50 ± 5) % relative humidity until a constant weight is obtained, that is, mass variation is less or equal to 0,1% on 3 consecutive measurements performed within 24h.