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# Product Guideline No.11

*Manufactured products based on plant or animal fibres*

**ASSOCIATION POUR LA CERTIFICATION DES MATERIAUX ISOLANTS**

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**CSTB - LNE**



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## 1 Purpose

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This Product Guideline supplements the measures in the General Guidelines.

This Product Guideline concerns panels and rolls based on plant or animal fibres.

## 2 Additional elements of the certificate application technical file

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

- Proof of suitability for use: Technical Assessment, Technical Application Document or ATEX for case a in progress with a favourable assessment; Pass innovation
- Declaration of compliance with the regulatory measures, in particular with the Biocide Directive and Regulation (EU) No.528-2012 concerning the marketing of biocide products;

The file contains information concerning the following elements:

- Raw materials
  - geographical 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 in accordance with EC regulation No.1774/2002 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

The characteristics which can be certified are the characteristics listed in the table below, supplemented by the following characteristics:

- Service compression strength, normal service deformation
- Class of insulating underlayers beneath screed or floating slab and under tiles
- Emissivity
- Specific heat capacity

Characteristics	Test method	Length and width of the test specimen <sup>a, b</sup>	Minimum number of measurements to obtain a test result	Specific conditions
Thermal resistance Thermal conductivity	NF EN 12667 or NF EN 12939	See NF EN 12667 or NF EN 12939	1	
Thickness	NF EN 823	Finished product	Roll: 1 Panels and strips: 3	Method B.1, 50 Pa or 250 Pa, see 4.2.3 of the standard NF EN 13162
Reaction to fire	See EN 13501-1			
Resistance to traction parallel to the surfaces	NF EN 1608	See NF EN 1608		
Resistance to traction perpendicular to the surfaces	NF EN 1607	200×200 300×300	5 3	
Tear resistance	NF EN 12310-1	See NF EN 12310-1	Rolls: 3 Strips: 5 Panels: 1	
Dimensional stability under the specified temperature conditions	NF EN 1604	200×200	3	
Dimensional stability under the specified temperature and humidity conditions	NF EN 1604	200×200	3	48 hours at 70 ± 2°C and 50 ± 5 % HR



Characteristics	Test method	Length and width of the test specimen <sup>a, b</sup>	Minimum number of measurements to obtain a test result	Specific conditions
Compression stress or compression strength	NF EN 826	200×200 300×300	5 3	
Point load	NF EN 12430	300×300	3	Determination at 5 mm deformation
Creep in compression	NF EN 1606	200×200	3	
Short-term water absorption	NF EN 1609	200×200	4	Method A
Transmission of water vapour	NF EN 12086	See 6.1 in NF EN 12086	3	vapour barrier <sup>c</sup>
Dynamic stiffness	NF EN 29052-1	200×200	3	At least on minimum and maximum thicknesses
Thickness, $d_L$	NF EN 12431	200×200	3	
Thickness, $d_B$	NF EN 12431			
Long-term thickness reduction	NF EN 1606			
Acoustic absorption	NF EN ISO 354	Minimum 10 m <sup>2</sup>	1	
Resistance to air flow	NF EN 29053	Dependant on the equipment	9	Method A
<p>a) Thickness of the finished product apart for reaction to fire.</p> <p>b) Dimensions in millimetres</p> <p>c) Products with a vapour barrier are tested in compliance with standard EN 12086, the thickness of the test specimen is that of the vapour barrier plus 2 to 3 millimetres.</p>				

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

The test methods applied by the pilot laboratory for each of the characteristics are defined in the previous table, supplemented by the following measures.



## 4.1 Thermal conductivity

The measures in Technical Specification No.1 apply.

Thermal conductivity is determined at the thickness defined below:

### 4.1.1 Products not compressed in packaging

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

### 4.1.2 Products compressed in packaging

Thickness is measured in compliance with standard NF EN 823 after storage of the material in its packaging for 9 weeks. Thermal measurement is made:

- at nominal thickness if it is lower than or equal to the average thickness measured,
- otherwise, at the average thickness measured.

For compressed products which expand over several days after opening the packaging, the thickness adopted is that measured 15 minutes after opening the packaging.

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 less than the nominal thickness, thermal measurement is made and its result incorporated in the sampling programme instead of that of the next sample.

## 4.2 Thermal resistance

Certified thermal resistance is defined according to the procedures in Technical Specification No.2.

## 4.3 Reaction to fire

The measures in Technical Specification No.3 apply.

## 4.4 Service compression strength, normal service deformation

The measures in Technical Specification No.5 apply.

## 4.5 Class of insulating underlayers beneath screed or floating slab and under tiles

If the class of insulating underlayers beneath screed or floating slab and under tiles defined in the DTU Code of practice 52.10 P1-2 is certified, the procedures in Technical Specification No.6 apply.



## 4.6 Emissivity

If the product has a surface coating for which the emissivity is certified, the procedures in Technical Specification No.7 apply.

## 4.7 Specific heat capacity

The measures in Technical Specification No.10 apply.

## 4.8 Creep in compression

Creep in compression,  $X_{ct}$ , and the total reduction in thickness,  $X_t$ , must be determined after at least one hundred and twenty-two days of testing under a declared compression stress,  $\sigma_c$ , given in intervals of at least 1 kPa, and the results must be extrapolated thirty times, which corresponds to ten years, to obtain the declared levels in accordance with standard EN 1606. Creep in compression and the total reduction in thickness must be respectively declared in levels,  $i_2$  and  $i_1$ , of equal intervals of 0.1 mm under the declared stress. No test result must be higher than the levels declared under the declared stress.

NOTE 1: For designation code  $CC(i_1/i_2/y)\sigma_c$ , a declared level such as e.g.  $CC(2.5/2/10)50$  indicates a creep in compression of less than 2 mm and a total reduction in thickness of less than 2.5 mm, after extrapolation corresponding to 10 years (or thirty times one hundred and twenty-two days of testing) under a declared compression stress of 50 kPa.

NOTE 2: Extrapolation of the results beyond the four months of tests can only be done if at least 5 years of experience are available of the same kind of material and on condition that Findley's Power Law is validated.

## 4.9 Compression at 10 %

Compression at 10% is determined by a compression strength test according to NF EN 826 with 5 test specimens 200 x 200 mm or 3 test specimens 300 x 300 mm.



## 5 Factory production control

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

Characteristic	Minimum test frequency <sup>a</sup>				
	Direct test			Indirect test	
				Test method	Frequency
Thermal resistance – Thermal conductivity	Once a day or			–	–
	Once every 3 months for each product/group of products and indirect test			Air permeability; and	Once every 2 hours
				Either surface density or apparent density; or	Once an hour
				manufacturer method	Once an hour
Length and width	Rolls Once every 4 hours	Strips Once every 2 hours	Panels Once every 2 hours	Manufacturer method	Once every 2 hours
Thickness	Once every 4 hours	Once every 4 hours	Once every 4 hours	–	–
Reaction to fire	See Technical Specification No.3 (paragraph 5.2)				
Resistance to traction parallel to the surfaces	Once a year and indirect test			Manufacturer method	Once every 8 hours
Resistance to traction perpendicular to the surfaces	Once every 8 hours and indirect test			Apparent density	Once every 4 hours
Dimensional stability at specified temperature	Type tests <sup>b</sup>			–	–
Dimensional stability under the specified temperature and humidity conditions	Type tests <sup>b</sup>			–	–





Characteristic	Minimum test frequency <sup>a</sup>		
	Direct test	Indirect test	
		Test method	Frequency
Compression stress or compression strength	Once every 8 hours and indirect test	Apparent density	Once every 4 hours
Point load	Type tests <sup>b</sup>	-	-
Creep in compression	Type tests <sup>b</sup>	-	-
Short-term water absorption	Once a month and indirect test	Manufacturer method	Once a day
Long-term water absorption	Once a month and indirect test	Manufacturer method	Once a day
Transmission of water vapour	Once a year	-	-
Dynamic stiffness	Once a year and indirect test	Manufacturer method	Once a day
Thickness, $d_L$	Once every 2 hours	-	-
Thickness, $d_B$	Once a day		
Long-term thickness reduction	Type tests <sup>b</sup>		
Acoustic absorption	Type tests <sup>b</sup>	-	-
Resistance to air flow	Once a year and indirect test	Manufacturer method	Once a day
Biological resistance	Type tests <sup>b</sup> once/3 years and indirect tests	Manufacturer method	Once a week
Emission of dangerous substances	Test method unavailable <sup>c</sup>	-	-

a) By minimum testing frequency, expressed in test results, is meant the minimum frequency for each unit/production line under stable conditions. In addition to the testing frequencies given above, testing of the pertinent properties of the product must be repeated in case of changes or modifications likely to affect product compliance. With regard to the mechanical properties, the testing frequencies are given independently of product changes. Moreover, the manufacturer must establish internal rules for adjustment of the procedure affecting these properties when a product change occurs.

b) Type testing, see EN 13172 (paragraph 6).

c) No frequency is given, due to the fact that the test methods are not available yet.

d) for raw material controls, refer to §3.3.3 of the General Guidelines



In addition to these measures, for the following certified characteristics for the purposes of these regulations and described in detail in the various Technical Specifications, the procedures (methods and minimum test frequencies) provided for in this Technical Specification apply:

- Reaction to fire
- Service compression strength and normal service deformation
- Class of insulating underlayers beneath screed or floating slab and under tiles
- Emissivity
- Specific heat capacity

Moreover, the manufacturer must have at least ten thermal resistance 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 at regular intervals 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.

For new products, the ten thermal resistance or thermal conductivity test results must come from measurements spread over a minimum period of ten days.

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 at least once 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.

<b>Characteristics</b> (paragraph 3)	<b>Test methods</b>	<b>Place of performance of the tests</b>
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
Reaction to fire <sup>1</sup>	NF EN 13501-1	Pilot laboratory
<b>Other characteristics or criteria</b>	<b>Test methods</b>	<b>Place of performance of the tests</b>
Emissivity	Technical Specification No.7	Pilot laboratory
Density	NF EN 1602	Pilot laboratory
Service resistance (R <sub>CS</sub> )	Technical Specification No.5	Production unit and pilot laboratory, if not compliant

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.

<sup>1</sup> The reaction to fire classification is monitored by conducting random tests once every two years.



Random testing is performed for reaction to fire in the case of products coming under conformity certificate system 1 for CE marking, in the case of the Keymark or at the manufacturer's request. In addition, for the follow-up tests, the following measures apply: one SBI test on the worst case according to the initial type testing.

## 7 Certificate maintenance rules

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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 according to the requirements of paragraph 4 of European standard NF EN 13162<sup>1</sup>;
- For the thermal performance according to paragraphs 2.1 or 2.2 of Technical Specification E;
- For the following characteristics certified under these regulations and described in detail in the various Technical Specifications, according to the conditions stipulated in these Technical Specifications:
  - Reaction to fire
  - Service compression strength and normal service deformation
  - Emissivity

## 8 Marking Rules

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The marking rules laid out in Technical Specification D apply.

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

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<sup>1</sup> Due to an inconsistency between the French and English versions of the 2009 edition of this standard, the English version is to be used for evaluation of the thickness tolerances.