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Product Guideline No.4

Factory-made rigid polyurethane foam products

ASSOCIATION POUR LA CERTIFICATION DES MATERIAUX ISOLANTS

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1 Purpose

This Product Guideline supplements the measures in the General Guidelines.

This Product Guideline concerns panels of rigid polyurethane foam, in accordance with harmonised European standard NF EN 13165.

2 Additional elements of the certificate application technical file

In the case of products coated with leak tight facings, the technical file defined in paragraph 2.2 of the General Guidelines may be supplemented by a study by the manufacturer of the oxygen distribution rate (ASTM 3985) of the facing only.

In order to prove that the manufactured products are constituted of a coating similar to that tested, the following controls must be performed after acceptance of the product:

- Verification at acceptance of the compliance of the coating delivered with the specifications defined between the supplier and its customer.
- The permeability of the coating is checked by an independent laboratory at least once a year for each factory, either by measuring the level of diffusion of oxygen of the facing only, or by measuring the thermal conductivity according to the accelerated ageing method (175 +/- 5 days at 70 +/- 2°C).

The lead member shall check that these measures are being applied during follow-up audits of the production unit.

If the industrialist has third party controls in relation to the clauses described, ACERMI will take them into account.

3 Characteristics which can be certified

The characteristics which can be certified are the characteristics listed in paragraph 4 of standard NF EN 13165, 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
- Modulus of service elasticity E_s



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 paragraph 5 of standard NF EN 13165, supplemented by the following measures.

4.1 Thermal conductivity

The measures of paragraph 1.1 of Technical Specification No.1 apply.

Determination of the thermal conductivity values declared or of reference during initial examination according to the two methodologies defined in standard NF EN 13165:

- by the conventional increase method,
- by determination of the increase in the thermal conductivity of the test specimens after 6 months ageing in an oven at 70°C.

If there is a difference between the two methods, the second method is adopted for determination of the certified thermal conductivity during acceptance by the lead member.

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 guideline 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.



5 Factory production control

Production control in the production unit satisfies the requirements of appendix B of European standard NF EN 13165.

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

In addition, the following specific measures must be complied with.

5.1 Thickness, length, width and density

The thickness, length, width and density are checked on each product, each thickness and each type of facing once after adjusting the machine and once after each batch of a maximum of 250 m³. In the case of small production runs (< 250 m³), the controls shall be performed on each product at least once after adjusting the machine.

The thickness measurements are made in accordance with standard NF EN 823 (or by any other method leading to the same results) in line with the following minimum provisions:

- measuring equipment: the accuracy of the instrument used must be compatible with the stated thickness tolerances. The tape measure should be avoided as the sole means of measurement for thickness controls.
- sampling: the measurements are made on a full-sized slab or having a minimum length of 1 m. If it is impossible to measure such dimensions, the minimum dimensions may be reduced, with the agreement of the lead member, based on specific proof that the sample for thickness measurements is representative.
- measurement plan: the thickness is measured according to the measurement plan in standard NF EN 823, at a minimum of 4 points, 3 of which are distributed along the edges of the slab and 1 in the centre, where required (this measurement may be obtained after cutting the sample in two). Based on specific proof that the thickness at the edges and in the centre of the slabs is uniform, the thickness checks may be made on the edges of the slab only. Thickness in the centre of the slab shall be verified periodically (e.g. during the follow-up audits).

The lengths and widths are measured in accordance with standard NF EN 822 complying at least with the measurement plan indicated. These measurements are made on the full-scale product (slab) using a tape measure.

The density is determined in accordance with standard NF EN 1602 based on the dimensional measurements defined above. This measurement can be made including the facings, the weight of



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which being then deducted from the result. However it is necessary to cross-check periodically on products from which the facing has been removed.

5.2 Compression resistance

Levels I1, I2 and I3: no tests for products having a density greater than 30 kg/m³ and a thickness less than or equal to 120 mm.

Levels I4 and I5: periodical check according to the test defined by test method 75-301, the frequency of which is defined according to the difference between the test results and the certified level.

5.3 Dimensional stability

A period of stabilisation is generally required. This period depends on the product and the certified level. Consequently, the manufacturing dates must appear on the products.

5.4 Cohesion

For products having a cohesion at least twice that of the certified level, no test is required. If this is not the case, a periodical control must be performed concerning either cohesion or bending.

The frequency of testing varies according to the products and is in general at least once every 24 hours.

For multi-layer products, the control is performed on the assembled product.

5.5 Water vapour permeability

Tests may be necessary when satisfaction of the certified level of permeability depends on the quality of one or more coatings. In this case, the tests concern either the coating or the coated product. The frequency of these tests depends on the nature of the coating and the difference between the results of the tests and the certified level.

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 relevant product:

- thermal conductivity and resistance
- traction perpendicular to the surfaces
- Rcs, ds

The tests are conducted in accordance with the measures in European standard NF EN 13165, supplemented if applicable by the procedures described in the Technical Specifications corresponding to the characteristics tested.

Characteristics (NF EN 13165)	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
Reaction to fire ¹	NF EN 13501-1	Pilot laboratory
Traction perpendicular to the surfaces	NF EN 1607	Production unit and if not compliant, at the pilot laboratory
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

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



Service resistance (R_{CS})	Technical Specification No.5	Production unit and if not compliant, at the pilot laboratory
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The certifying body may also perform verification 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.

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 key-mark or at the manufacturer's request. In addition, for the follow-up tests, the following measures apply: one SBI test and one ignitability test on the worst case according to the initial type testing.

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 according to the requirements of paragraph 4 of European standard NF EN 13165;
- For 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

The marking rules laid out in Technical Specification D apply.

In particular, the information label complies with the measures in paragraph 3.1.1 of this Technical Specification.