

GNB-CPD SH02	Guidance from the Group of Notified Bodies for the Construction Products Directive 89/106/EEC	NB-CPD/SH02/06/036 Issued: 13 July 2006 APPROVED – GUIDANCE
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GNB-CPD position paper from SH02 - EN 12004:2001

Reaction to fire testing protocol for adhesives for tiles, floorings and wall and ceiling finishes

General scope, limitations and aim of this guidance for Notified Bodies (NBs)

This position paper contains guidance for Notified Bodies (NBs) involved in the attestation of conformity of reaction to fire of adhesives for tiles, floorings and wall and ceiling finishes according to EN 12004:2001. The purpose is to help NBs work equivalently and come to common judgments. This guidance contains informative material (which NBs should or may follow) and normative guidance (which NBs shall follow or at least work equivalently to as circumstances demand).

This guidance is thought necessary to provide clarity and completeness for NBs so that they can work equivalently. It **supplements and makes practical for NBs** the harmonized standard EN 12004:2001, approved AG guidance, and Standing Committee guidance in the form of GPs, which also apply - unless otherwise explicitly stated in this guidance. This position paper should **not** contradict nor extend the scope of the work and role of a NB, nor impose additional burdens on the manufacturer, beyond those laid down in the CPD and EN 12004:2001.

This guidance should be considered valid until the relevant standards are amended to include the guidance (as thought fit by the CEN/TC); or until guidance from Commission, SCC, and AG has changed on relevant matters. Whereupon, the paper should be considered for withdrawal/revision and be replaced by new guidance as necessary.

This position paper was considered approved by SH02 in June 2004 and by Advisory Group (AG) on 29 April 2005.

1 Background / consideration

FSG Recommendation 018

The EC has been informed that EN 12004 covering adhesives for tiles is not in conformity with the mandate under the CPD as it does not include a requirement for reaction to fire performance. The EC Fire Regulators' Group has confirmed that national regulations do exist for these products and until CEN is able to amend the standard the FSG was asked to prepare recommendations on how to test such adhesives for their reaction to fire performance.

2 Agreement

The attached procedures are to be followed.

3 Introduction

The requirements for adhesives concerning reaction to fire is regarded for the tiles, floorings and wall and ceiling finishes in combination with the adhesive. The reaction to fire performance of adhesives is therefore tested in end use condition with quite that material/product relevant for the end use. Their intended end-use substrate(s) is(are) to be taken into account as well. Normally, the tile, flooring and wall and ceiling finish is therefore tested together with the adhesive and not the adhesive alone. Test results are subsequently valid for the combination of tile for wall and ceiling finish together with and not for the adhesive alone.

Thus, the adhesives would have to be tested together with, and with regard to, their end use products and substrates in the test methods, where this is relevant (EN ISO 11925-2 ignitability, EN ISO 9239-1 flooring, EN 13823 SBI. However, for the methods EN ISO 1182 and EN ISO 1716, which are substrate and product independent material test, they would be tested on their own.

Adhesives are supposed to be homogeneous products according to EN 13501-1 clause 3.1.3. when tested to EN ISO 1182 and EN ISO 1716.

4 Relevant test methods

Five test methods could apply when testing the reaction to fire behaviour of adhesives for tiles, floorings and wall and ceiling finishes within the euroclass system:

EN ISO 1716

EN ISO 1182

EN ISO 9239-1 (applies for adhesives for floor coverings only)

EN 13823 (applies for adhesives for wall and ceiling finishes only)

EN ISO 11925-2

The number of specimens mentioned in the following clauses means the minimum number or mass of specimens needed for performing the test. It has to be taken into consideration that more specimens could be needed when clause 7 of EN 13501-1 should be applied.

5 Testing according to EN ISO 1182

5.1 General

This test procedure is testing just the material without taking into consideration the end use application.

At least five cylindrical specimens with a volume of $(76 \pm 8) \text{ cm}^3$, a diameter of $(45 \pm 2) \text{ mm}$ and a height of $(50 \pm 3) \text{ mm}$ are necessary for a complete test. Specimens of samples with a thickness smaller than 50 mm have to be constructed e.g. by stacking an appropriate number of layers, curing in an appropriate mould, or cutting from a mould block.

Parameters which have to be considered when testing are:

- composition of the adhesive;
- thickness/applied mass (only in respect to sample preparation);
- density.

5.2 Composition

This parameter is the most important parameter when testing. Each adhesive with different composition has to be tested. No extended application of test results can be done with respect to this parameter.

5.3 Thickness/applied mass

As EN 1182 is a test on just the material without taking into consideration the end use application, it is not necessary to run tests covering the thickness range of the product in end use. Nevertheless, special rules apply for making specimens acc. to adhesive's thickness/applied mass.

5.4 Density

Covering a range of density can be done by testing the maximum density. The test result is valid for the range of all densities up to the tested limit.

5.5 Organic content

The amount and the nature of organic substance present in the adhesive influences the fire performance parameters of this test. In this document "organic content" refers to the amount of organic material per unit volume that is present in the adhesive. The organic content is closely related to the fire performance parameters EN ISO 1182. The higher the organic content the higher temperature rise in the EN ISO 1182 furnace. Also flame duration and mass loss are influenced. Therefore a test performed on an adhesive of the same composition with the highest organic content will be equally valid for the same adhesive with a lower organic content.

6 Testing according to EN ISO 1716

6.1 General

This test procedure tests only the material without taking into consideration the end use application.

For an adhesive a representative sample of at least 50g has to be taken from 5 randomly selected parts of the product, e.g. from a cured mould block.

Parameter which is to be considered when testing and calculating is:

- composition of the adhesive.

6.2 Composition

This parameter is the important parameter when testing. Each adhesive with different composition has to be tested. No extended application of test results can be done with respect to this parameter.

6.3 Organic content

The amount and the nature of organic substance present in the adhesive influences the fire performance parameters of this test. In this document "organic content" refers to the amount of organic material per unit volume that is present in the adhesive. The organic content is closely related to the fire performance parameters in EN ISO 1716 . The higher the organic content the higher the PCS value. Therefore a test performed on an adhesive of the same composition with the highest organic content i.e. resulting in the highest PCS-value when tested to EN ISO 1716, will be equally valid for the same adhesive with a lower organic content.

7 Testing according to EN 13823 - SBI test

7.1 General

This test method takes into regard the end use application. The requirements concerning reaction to fire is regarded for the tiles, and wall and ceiling finishes in combination with the adhesive. The reaction to fire performance of adhesives is therefore tested in end use condition with quite that material/product relevant for the end use. Their intended end-use substrate(s) are to be taken into account as well. The tile, and wall and ceiling finish is tested together with the adhesive and the substrate, and not the adhesive alone.

Parameters which have to be considered when testing are:

- composition of the adhesive;
- applied mass (weight per unit area);
- product to be glued with the adhesive;
- substrate(s) as intended end use.

7.2 Composition

This parameter is the most important parameter when testing. Each adhesive with different composition has to be tested. No extended application of test results can be done with respect to this parameter.

7.3 Applied mass (weight per unit area)

The applied mass (weight per unit area) of an adhesive influences the reaction to fire performance of the sample assembly (product+adhesive+substrate) and corresponds to the thickness as well as density of the adhesive. Covering a range of applied mass is possible by testing the maximum applied mass. The test result is valid for the range up to the tested limit.

7.4 Product to be glued with the adhesive

Reaction to fire of adhesives is regarded for the tiles and wall and ceiling finishes they are intended to be used in combination with. The reaction to fire performance is therefore tested in end use condition with quite that material/product relevant for the intended end use.

7.5 Substrate(s) as intended end use

The same as was said for the product applies for the substrate. The intended end-use substrate(s) is(are) to be taken into account as well. The adhesives, together with the tiles and wall and ceiling finishes have to be tested on a substrate representative for the substrate on which they are used in practice. EN 13238 is relevant for the choice of the substrate which has to be used in the test. If a substrate is used which is not according to EN 13238 then the test result is valid solely for the substrate used in the test.

7.6 Mounting & Fixing in accordance with EN 13823

The adhesives would have to be tested together with, and with regard to, their end use products and substrates in the SBI test method. Test results are subsequently valid for the combination of tile for wall and ceiling finish together with and not for the adhesive alone. Thus, all testing regulations for the related product(s) (see 5.4), according to e.g. relevant product standard(s), ETAG(s), recommendations by GNB FSG SH02, etc., together with mounting and fixing according to EN 13823 would apply.

The dimensions of the specimens are:

	Length	Height
Short wing	(495 ± 5) mm	(1500 ± 5) mm
Long wing	(1000 ± 5) mm	(1500 ± 5) mm

The end use application has to be considered when planning the test. The specimens have to be representative of the wall and ceiling finish system.

The type and dimensions of materials and products used, the dimensions and fixing location, etc shall be recorded in the test report.

8 Testing according to EN ISO 9239-1 - flooring test

8.1 General

This test method takes into regard the end use application. The requirements concerning reaction to fire is regarded for the tiles and floorings and in combination with the adhesive. The reaction to fire performance of adhesives is therefore tested in end use condition with quite that material/product relevant for the end use. Their intended end-use substrate(s) are to be taken into account as well. The test results are valid only for the tile or flooring together with the adhesive and the substrate, and not the adhesive alone.

Note: According to EN ISO 9239-1, testing of floor coverings without adhesives gives a field of application for both with and without the use of adhesives.

Parameters which have to be considered when testing are:

- composition of the adhesive;
- applied mass (weight per unit area);
- product to be glued with the adhesive incl. underlayer(s) and interlayment(s);
- substrate(s) as intended end use.

8.2 Composition

This parameter is the most important parameter when testing. Each adhesive with different composition has to be tested. No extended application of test results can be done with respect to this parameter.

8.3 Applied mass (weight per unit area)

The applied mass (weight per unit area) of an adhesive influences the reaction to fire performance of the sample assembly (product+adhesive+substrate) and corresponds to the thickness as well as density of the adhesive. Covering a range of applied mass is possible by testing the maximum applied mass. The test result is valid for the range up to the tested limit.

8.4 Product to be glued with the adhesive incl. underlayer(s) and interlayer(s)

Reaction to fire of adhesives is regarded for the tiles and floorings they are intended to be used in combination with. The reaction to fire performance is therefore tested in end use condition with quite that material/product relevant for the intended end use.

Floor covering systems utilising any underlayer(s) or interlayer(s) in the end use shall be tested with this underlayer(s) or interlayer(s). The test result is valid solely for the underlayer(s) or interlayer(s) used in the test, too.

8.5 Substrate(s) as intended end use

The same as said for the product applies for the substrate. The intended end-use substrate(s) are to be taken into account as well. The adhesives, together with the tiles or floorings have to be tested on a substrate representative for the substrate on which they are used in practice. EN 13238 is relevant for the choice of the substrate which has to be used in the test. If a substrate is used which is not according to EN 13238 then the test result is valid solely for the substrate used in the test.

8.6 Specimens and testing in accordance with EN ISO 9239-1

The adhesives would have to be tested together with, and with regard to, their end use products (incl. underlayer(s) and interlayer(s)) and substrates in the floorings test method. Test results are subsequently valid for the combination of tile or flooring together with and not for the adhesive alone. Thus, all testing regulations for the related product(s) (see 6.4), according to e.g. relevant product standard(s), ETAG(s), recommendations by GNB FSG SH02, etc., together with mounting and fixing according to EN ISO 9239-1 would apply.

The dimensions of the specimens are:

at least 3 specimens with the size (1050 ± 5) mm x (230 ± 5) mm are necessary for a complete test.

Testing tiles shall be done in accordance with EN ISO 9239-1, clause 5.3. When testing floor covering tiles which have a width smaller than the width of a specimen required for the EN ISO 9239-1 test, it is proposed to have also a lengthwise joint in the centreline of the specimen.

The end use application has to be considered when planning the test. The specimens have to be representative of the floor covering system. The type and dimensions of materials and products used, the dimensions and fixing location, joints etc. shall be recorded in the test report.

9 Testing according to EN ISO 11925-2

9.1 General

This test method takes into regard the end use application. The requirements concerning reaction to fire is regarded for the tiles, floorings and wall and ceiling finishes in combination with the adhesive. The reaction to fire performance of adhesives is therefore tested in end use condition with quite that material/product relevant for the end use. Their intended end-use substrate(s) are to be taken into account as well. The test results are valid only for the tiles, floorings and wall and ceiling finishes together with the adhesive and the substrate, and not the adhesive alone.

Parameters which have to be considered when testing are:

- composition of the adhesive;
- applied mass (weight per unit area);
- product to be glued with the adhesive (incl. underlayer(s) and interlayment(s), where relevant);
- substrate(s) as intended end use

9.2 Composition

This parameter is the most important parameter when testing. Each adhesive with different composition has to be tested. No extended application of test results can be done with respect to this parameter.

9.3 Applied mass (weight per unit area)

The applied mass (weight per unit area) of an adhesive influences the reaction to fire performance of the sample assembly (product+adhesive+substrate) and corresponds to the thickness as well as density of the adhesive. Covering a range of applied mass is possible by testing the maximum applied mass. The test result is valid for the range up to the tested limit.

9.4 Product to be glued with the adhesive incl. underlayer(s) and interlayment(s)

Reaction to fire of adhesives is regarded for the tiles, floorings and wall and ceiling finishes they are intended to be used in combination with. The reaction to fire performance is therefore tested in end use condition with quite that material/product relevant for the intended end use.

Floor covering systems utilising any underlay(s) or interlayment(s) in the end use shall be tested with this underlayer(s) or interlayment(s). The test result is valid solely for the underlay(s) or interlayment(s) used in the test, too.

9.5 Substrate(s) as intended end use

The same as said for the product applies for the substrate. The intended end-use substrate(s) are to be taken into account as well. The adhesives, together with the tiles, floorings or wall and ceiling finishes have to be tested on a substrate representative for the substrate on which they are used in practice. EN 13238 is relevant for the choice of the substrate which has to be used in the test. If a substrate is used which is not according to EN 13238 then the test result is valid solely for the substrate used in the test.

9.6 Specimens and testing in accordance with EN ISO 11925-2

The adhesives would have to be tested together with, and with regard to, their end use products (incl. underlayer(s) and interlayer(s)) and substrates in ignitability test. Test results are subsequently valid only for the given combination of tiles, floorings or wall and ceiling finishes together with and not for the adhesive alone. Thus, all testing regulations for the related product(s) (see 7.4), according to e.g. relevant product standard(s), ETAG(s), recommendations by GNB FSG SH02, etc., together with sample preparation and testing procedures according to EN ISO 11925-2 would apply.

The dimensions of the specimens are:

at least 6 specimens with the size 250 mm x 90 mm are necessary for a complete test.

The end use application has to be considered when planning the test. The specimens have to be representative of the tiles, floorings or wall and ceiling finishes system. The type and dimensions of materials and products used etc. shall be recorded in the test report.

Only surface flaming is relevant for floor coverings.