

GNB-CPD SH02	Guidance from the Group of Notified Bodies for the Construction Products Directive 89/106/EEC	NB-CPD/SH02/07/048 Issued: 2 February 2007 APPROVED – GUIDANCE
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GNB-CPD position paper from SH02 - Reaction to fire testing

General Template for Guidance on testing and classification protocols and mounting and fixing procedures - Testing for reaction to fire of products

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 performance of construction products. 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 standards, 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 the harmonized standards.

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 on 23 November 2006 and by Advisory Group (AG) on 26 January 2007.

1 Background / consideration

FSG Recommendation 023

Basic rules are required for reaction to fire testing of products as placed on the market (product itself), including instructions for mounting and fixing (M&F), taking into account standardised conditions, whichever end-use application is aimed for the product.

2 Scope

This document gives basic rules for reaction to fire testing of products as placed on the market (product itself), including instructions for mounting and fixing (M&F), taking into account standardized conditions, whichever end-use application is aimed for the product.

Products shall be tested directly exposed to the thermal attack.

NOTE This document should be used by specification writers producing for example product standards to give the necessary instructions for mounting and fixing. In the absence of a product standard this document should be used directly. This document makes reference to CEN documents and others. The last version of referenced documents should always be used.

3 Product and end use application parameters

Tables 1 and 2 give the parameters which have to be considered when determining a products reaction to fire performance and the field of application of the test result.

Table 1 - Product parameters

Product Parameters	EN ISO 1182 (class A1 – A2)	EN ISO 1716 (class A1 – A2)	EN 13823 (class A1 – D)	EN ISO 9239-1 (class B _{fi} - D _{fi})	EN ISO 11925-2 (class B - E)
Composition of product e.g. <ul style="list-style-type: none"> • chemical composition • fibre type • flame retardant • organic content etc	X	X	X	X	X
Shape and size	-	-	X	X	X
Density / Area weight	X	-	X	X	X
Colour	-	-	X	X	X
Thickness	-	-	X	X	X
Surface structure, e.g. <ul style="list-style-type: none"> • Smoothness • Texture • non-flat 	-	-	X	X	X
Surface coating/facing number and type of layers	X	X	X	X	X

Legend: X = important for the products reaction to fire
- = not relevant

Table 2 - End-use application parameters

Parameter	EN 13823 (class A1-D)	EN ISO 9239-1 (class A1 _{fi} -D _{fi})	EN ISO 11925-2 (class B-E)
Substrate	X	X	-
Airgaps/cavities	X	X	-
Joints	X	X	-

Edges	X	X	X
Product orientation and geometry	X	X	X
Size and positioning of product	X	X	X
Fixings/attachments and supports	X	X	X

Legend: X = important for the products reaction to fire
- = not relevant

4 Standardised mounting & fixing

Further guidance on standardised mounting and fixing can be found in the document TC 127 N2156 from CEN/TC127 ad hoc 40.

4.1 EN 13823 (SBI)

Conditioning of test specimens prior to testing shall follow the rules of EN 13238.

The field of application of the classification shall be given in the declaration/certification of conformity, in the classification report and in the manufacturer's technical literature.

4.1.1 Substrate

The substrate to be used in the test should be chosen in accordance with EN 13238. This standard also gives the field of application for the standardised substrates.

If testing to obtain class A1 in accordance with EN 13501-1 footnote 2a, the standard substrate shall be the calcium silicate board described in EN 13238. There are no end use requirements in this case as class A1 is considered for material properties only.

Recommendations for joints in substrates and re-use of substrates are given in CEN/TC127 N2156, §5.3.3.1.

4.1.2 Air gaps/cavities

Recommendations for the types, size and ventilation of air gaps are given in CEN/TC127 N2156, §5.4.4. This document also gives guidance on how to create the air gap using a frame, supporting elements or spacers.

4.1.3 Joints

The presence of joints close to the burner can influence the test results and hence the field of application of the classification. This should be taken into account if the product is intended to be installed with joints in its end-use application.

Where a product is to be tested with a horizontal and a vertical joint, these may preferably be combined in one test specimen or alternatively introduced in two different test specimens. Positioning of the joints as given in EN 13823 is shown in figure 1.

If horizontal and vertical joints are to be tested separately, preliminary testing can be used to determine the worst case. If one orientation shows worse classification parameter results for all parameters, this orientation can be used to finish the series and the results will also cover the other orientation.

4.1.4 Edges

The edge of a construction product is the surface that is fastened together at a joint or is the boundary part of a structure formed from one or more components. For multilayer products the field of application of the classification can be influenced by how the edges of the product are designed.

4.1.5 Product orientation and geometry

If a product is different in different directions along the surface it should be tested in the direction reflecting end use when the product is mounted vertically. If this does not apply, the product should be tested in the direction corresponding to the worst case.

If an asymmetrical product can be exposed to fire (in end use) on one side only, then it shall only be tested from one side, providing that:

A clear declaration of the way of installation and side tested is given, and a clear identification of the side tested is mentioned in the classification obtained.

Marking and labelling of the product takes into account the side tested.

If an asymmetrical product in end use can be exposed to fire from either side, then it shall be tested on both sides. Two options are open in this case: either the worst test result will be used to declare the reaction to fire class of the product (valid for both exposed faces); or a declaration of the classification of each side is made, provided that the identification of the faces is clearly visible on the product and in the marking and labelling of the product.

Symmetrical products shall be tested on one side only.

4.1.6 Size and positioning of product

The size of the test specimens is given in EN 13823 chapter 5.1. The test specimens shall be cut from the product including their facings or coatings. Positioning of the test specimens shall meet the following specification:

Products having larger dimensions than the SBI test specimens shall be cut to size.

Products having smaller dimensions than the SBI test specimen shall be mounted in such a way that installation of full size products is started at the bottom corner line between both wings.

The specimens installed on the short wing shall cover (on their thickness) those installed at the long wing with a butt joint, see figure 1.

The maximum thickness of the test specimen including the substrate that can be installed in the SBI is 200 mm. Products thicker than 200 mm (or 160 mm for specimen with air gap, or 120 mm for free-standing) shall be cut to size from the non exposed side.

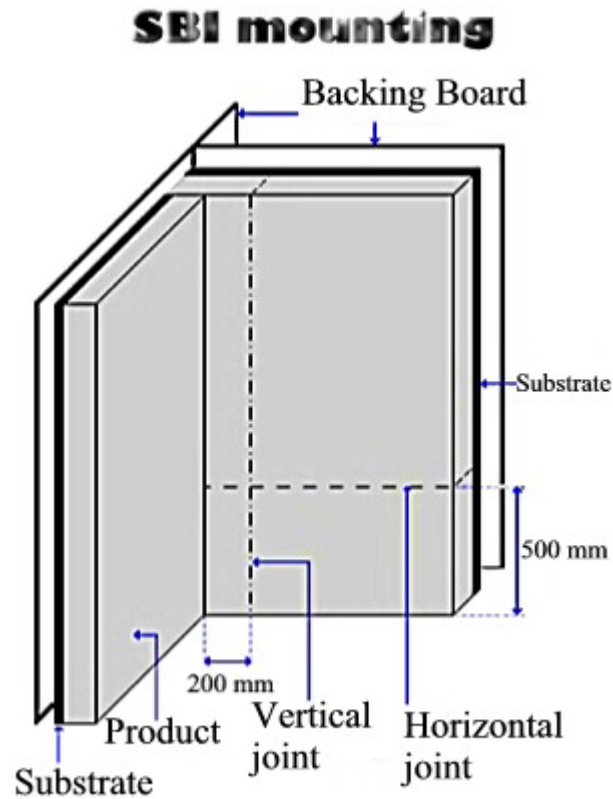


Figure 1 – Positioning of flat test specimen and substrate, note the orientation of the corner joint, see also EN 13823.

4.1.7 Fixings/attachments and supports

Fixing of the product shall be made according to the manufacturer's specification for the product. The field of application of the classification can be influenced by the type of fixings/attachments and supports used in the test.

Procedures for different product groups to be based on the recommendations given in CEN/TC127, N2156, §5.2.3.

If there is no procedure specified by the manufacturer the following mechanical fixing procedure can be applied.

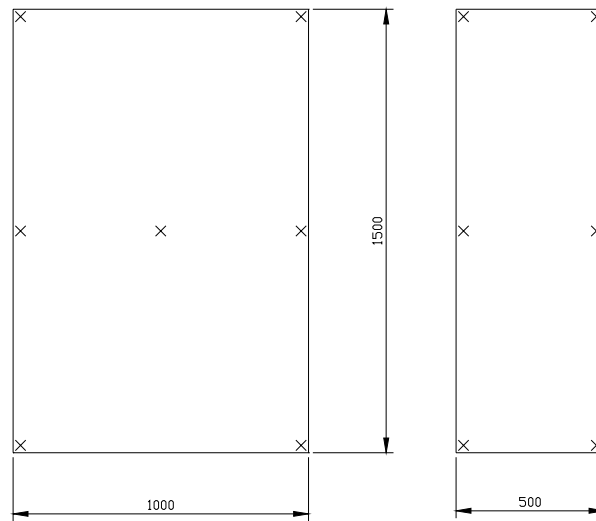


Figure 2. Positions of fixings, without specimen joints.

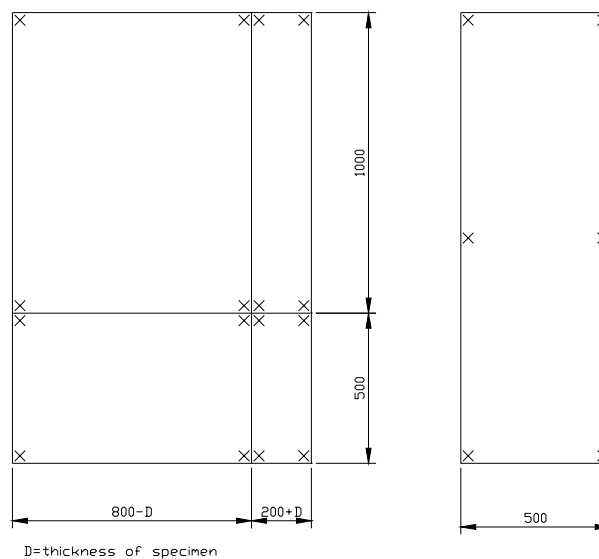


Figure 3. Positions of fixings, specimen with vertical and horizontal joints.

The positions of the joints are indicated with straight lines. There are joints only on the large wing.

4.1.8 Mounting and fixing for specific products and/or applications

For several types of products and/or applications additional M&F guidance is needed:

- in situ formed loose fill products;
- linear products;
- products applied horizontally in end-use application (and tested vertically).

4.2 EN ISO 9239-1

Conditioning of test specimens prior to testing shall follow the rules of EN 13238.

The field of application of the classification shall be given in the declaration/certification of conformity, in the classification report and in the manufacturer's technical literature.

The apparatus for this test was designed to allow the upper layer(s) of a floor to be tested (see definition of flooring). The upper layer comprises any surface finish with or without an attached backing and with any accompanying underlay, interlay and/or adhesive. Hence, it is not practical to test complete flooring assemblies.

4.2.1 Substrates

The substrate to be used in the test should be chosen in accordance with EN 13238. This standard also gives the field of application for the standardised substrates.

- Where floorings are to be applied in end-use application, to concrete floors and to other floors of class A2_{f1}-s1_{f1} or better of a density $\geq 1600 \text{ kg/m}^3$, fibre cement board should be the standard substrate for testing.
- Where floorings are applied to wood floors in end-use application, non-FR particleboard should be the standard substrate for testing.
- Where floorings are to be applied to lower density wood floors in end-use application, plywood manufactured to EN 636 may be used as an alternative wood substrate. The plywood should be (12 ± 2) mm thick and have a density of $(450 \pm 50) \text{ kg/m}^3$.

There should be no joints in the substrates used in EN ISO 9239-1 tests.

Recommendations for substrates and re- use of substrates are given in CEN/TC 127 N2156, §7.3.

4.2.2 Air gaps/cavities

Air gaps are spaces between flooring and the floor or other lower elements of a building. They may be created when the flooring is installed in its end-use application.

Air gaps/cavities may influence the test result. An effect of air gaps may be that flames attack both sides of the flooring and attack sub-constructions. Open or opening joints may cause this attack, or burning through may spread the fire.

If flooring is to be installed in its end-use application with an air gap between substrate and flooring, it should be tested with an air gap. The recommended air gap thickness is 10 mm. Due to the limited size of the test specimen holder in EN ISO 9239-1, the influence of a large air gap (such as occurs in a raised floor) should be determined by conducting the test on the flooring in the absence of a substrate.

4.2.3 Joints

A joint may be defined as the place at which two parts of the flooring are joined together.

Joints may influence the reaction to fire behaviour; e.g. flames may propagate more readily along a joint than over the surface of the flooring.

General

The parts of a flooring may be joined in various ways according to the product and its orientation. For jointed flooring (especially tiles), a joint should be formed across the width of the specimen situated 250 mm from the zero point. A joint should also be formed along the length of the specimen at the centreline from the zero point to the opposite cold side of the specimen. For more details reference is made to FSG recommendation 112.

A joint may be fixed by application of an adhesive, left open with a gap, or filled. It is important that the joint filler be cured for sufficient time to achieve their end-use properties before the jointed test specimen is subjected to the fire test. The minimum time for curing should be specified by the manufacturer or detailed in the European product standard.

The joints used should be clearly specified, consisting of type, width and the filler and/or adhesive used.

Joints formed with adhesive

The end-use application should be followed concerning to which surface the adhesive is applied (product or substrate). The adhesive may be a generic type (e.g. PVAc) or a specific one. The adhesive may be applied to the edges of the joint (for thick products) or to the faces of the product adhering it to a substrate (for thin products). Particular care should be made to ensure even coverage of the adhesive, especially at the edges of the joint.

Butt joints

Particular care should be taken in cutting products when joints are to be formed by butting two edges together (e.g. wall joints). In cases where poor cutting has created difficulties in abutting the parts uniformly, gaps may be filled. Where possible, this should reflect end-use practice but if it is necessary, the use of additional components should be recorded in test report.

Joint between tiles

In case of tiles, the edges of joints should be secured on the substrate by mechanical means. This in addition to the securing of the edges of the specimen by the specimen holder.

Test results of floorings tested without any cross joint are also valid for tile made out of that flooring.

If in the end use application additional materials shall be used in the joints, the tiles together with this additional material in the joint have to be tested separately ("testing the system").

For floor coverings consisting of tiles a joint shall be placed depending on the real size of the tile. This should be taken into account if the product is intended to be installed with joints in its end-use application.

The performance parameters for products tested with a joint following EN ISO 9239-1 are equally valid for the same product tested without a joint.

4.2.4 Edges

For the purpose of this document, the edge of a construction product is the surface that is fastened together at a joint or is the boundary part of a structure formed from one (or more) component(s).

No edges are exposed to the pilot burner or radiant panel in this test.

The specimen holder should cover the edges of floorings and substrates, since the edges of are not exposed to fire in end-use application. In case of tiles, the edges of joints should be secured on the substrate by mechanical means. This in addition to the securing of the edges of the specimen by the specimen holder.

4.2.5 Product orientation and geometry

Two orientation variations should be distinguished:

- The positioning of a product surface to or away from the fire. In this case the two positions are interchanged by 180 degrees rotation around an axis in the plane of the product. This may be relevant for any asymmetrical product, but normally asymmetrical flooring products only have one wear surface.
- The positioning of a directional effect in (the surface of) the product in the production direction or the direction perpendicular to the product direction. In this case the positions are interchanged by rotation around an axis perpendicular to the plane of the product.

For flexible flooring it may be assumed the production direction is as it comes off a roll. For wood and laminate flooring, the length direction may be assumed to be the production direction.

The production direction of the flooring should be identified with the manufacturer and results reported so that this direction is clearly understood.

Floorings should only be tested with their wear surface facing upwards exposed to the radiant panel and the pilot burner. The surface in the cavity under a raised floor are considered as wall and ceiling linings.

4.2.6 Size and positioning of product

There is no maximum thickness of the test specimen specified in EN ISO 9239-1. Maximum thickness is only limited by the specific design of the apparatus. A thickness of 38 mm should be regarded as the maximum thickness of floorings for test to EN ISO 9239-1.

4.2.7 Fixings/attachments and supports

Fixings may influence the test result. For floorings that in end-use application are fixed mechanically, the type and size of the fixings should be considered as well as their number and positions.

When an adhesive is used, the type and amount of adhesive, the way it is applied and the curing conditions are important. Lifting of a floor covering from the substrate during exposure to the radiant heat may allow underlying layers to contribute to the fire.

The adhesive may be a generic type (e.g. PVAc) or a specific one. If a specific adhesive is used in the test, the test result is only valid for this specific adhesive. If the test is performed without using

adhesives the test result is valid for the tested floor covering with and without using adhesives in end use application.

The method of fixing should be specified. It should consist of at least the composition, type, size, position and number of fixings.

Test results for flooring, which is not fixed to a substrate, cover also those applications where the flooring is fixed.

4.2.8 Mounting and fixing for specific products and/or end use applications

For several types of products and/or end use applications additional M&F guidance is needed:

- in situ liquid applied floorings;
- high pile carpets/ rugs;
- generic underlays.

4.3 EN ISO 11925-2 (small flame test)

prCEN/TS 15177:2004, Annex A – Influence of product parameters, on reaction to fire test performance.

The thickness of the test specimen is limited up to 60mm in EN ISO 11925-2. Therefore a test on a test specimen of 60mm thickness prepared from a product, according to agreed mounting and fixing rules, is equally valid for the product in all greater thicknesses.

Non-flat, curved and profiled products

When the product cannot be provided in the full specimen width of 90 mm, then the product may be tested in the form as in end use (e.g. one or more 250 mm long pieces of the product side by side). The length of the test specimen should be (250 +0/-1) mm.

4.3.1 Substrates

Substrates may influence the test result. There are a number of cases where a substrate could be omitted from the test procedure. Important parameters are thickness, density, heat capacity, heat conductivity, deformation of the product and the contribution of the substrate to the fire development.

4.3.2 Air gaps/cavities

Many of the effects of air gaps are not relevant in this small-scale test. Therefore it is not necessary to include an air gap in the test specimen.

4.3.3 Joints

According to the rule in the EN ISO 11925-2 standard, section 5.2, the main principle in this method is to test a specimen made of one piece. Secondly, edges are tested under edge flame attack if

edges can be exposed under end use conditions. Thus joints should not be part of the test specimen.

Joints should also not be included in substrates.

4.3.4 Edges

For the purpose of this document, the edge of a construction product is the boundary part of a structure formed from one (or more) component(s).

For products with a core (e.g. metal-faced sandwich panels), progress of internal combustion could be affected by the degree of sealing of the edges. The same applies to products with a cavity behind it.

For applications where the cut edges are protected in end use, metal flashings may be used in the test to cover the cut edge and shall be prepared to suit the thickness of the specimen.

In certain end use applications the cut edges are protected by flashings manufactured from other materials, e.g. plastics, that are different to the metal facings of the sandwich panel.

For these applications specimens shall be prepared with the end use flashing covering the cut edge to be tested.

Method for applications with protective flashings

The flame shall be applied both to the surface of the specimen and to the protected cut edge of the specimen.

4.3.5 Product orientation and geometry

Two orientation variations should be distinguished:

- The positioning of a product surface to or away from the fire. In this case the two positions are interchanged by 180 degrees rotation around an axis in the plane of the product. This may be relevant for any asymmetrical product.
- The positioning of a directional effect in (the surface of) the product in horizontal or vertical (or principally any) direction. In this case the positions are interchanged by rotation around an axis perpendicular to the plane of the product. This may be relevant for any product not consisting of one or more flat layers of constant thickness.

NOTE: In general a third variation in orientation should be distinguished: the horizontal versus vertical position. In EN ISO 11925-2, however, all building products are tested in the vertical position.

For non-symmetrical products the performance of the sides may be very different due to e.g. very different top layers.

At one side a product may have different reaction to fire performance due to a directional effect (like a surface with linear trapezoid profiles). The flame spread may be blocked or guided by the directional effect (the profile-direction).

Symmetrical products should be tested on one side only. This is also valid for asymmetrical products (i.e. products that in the thickness have no planes of symmetry) which can be installed with one of the sides exposed to the initial thermal attack only.

If a product is different in different directions along the surface it should be tested in the direction reflecting end use when the product is mounted on walls. If this does not apply, the product should be tested in the direction corresponding to the worst case.

If an asymmetrical product can be exposed to fire (in end use) on one side only, then it shall only be tested from one side, providing that:

- A clear declaration of the way of installation and side tested is given, and a clear identification of the side tested is mentioned in the classification obtained. Marking and labelling of the product takes into account the side tested.

If an asymmetrical product in end use can be exposed to fire from either side, then it shall be tested on both sides. Two options are open in this case: either the worst test result will be used to declare the reaction to fire class of the product (valid for both exposed faces); or a declaration of the classification of each side is made, provided that the identification of the faces is clearly visible on the product and in the marking and labelling of the product.

Products that have a structure of lamellas should be tested with the lamellas in the direction that appears in end use.

Where orientation effects are relevant and they occur on a single face and more than one orientation can occur in the end-use application, then all orientations should be tested. Preliminary testing can be used for determining the worst case; see the remark below on multilayer products.

Multilayer products should be tested following the procedure given in EN ISO 11925-2 and relevant technical specification(s). Both sides are tested for surface exposure if they are different. When the product thickness is more than 10 mm the side edge flame exposure should be used. For applications where one face cannot be exposed in practice, testing can be limited to the exposed face only. Classification report shall refer to the limitation of the field of application of the classification.

Little information is given in EN ISO 11925-2 on the practical aspects of this procedure. The following is additional guidance.

Identify the layer in the multilayer product which gives the worst case, by performing two tests at each possible flame application point (on each layer) according to EN ISO 11925-2.

Perform 6 tests on the identified worst case layer.

4.3.6 Size and positioning of product

prCEN/TS 15177:2004, Annex A – Influence of product parameters, on reaction to fire test performance.

The thickness of the test specimen is limited up to 60mm in EN ISO 11925-2. Therefore a test on a test specimen of 60mm thickness prepared from a product, according to agreed mounting and fixing rules, is equally valid for the product in all greater thicknesses.

Non-flat, curved and profiled products

When the product cannot be provided in the full specimen width of 90 mm, then the product may be tested in the form as in end use (e.g. one or more 250 mm long pieces of the product side by side). The length of the test specimen should be (250 +0/-1) mm.

4.3.7 Fixings/attachments and supports

Fixings/attachments and supports may influence the test result. Important parameters for these are composition, type, size, position and number.

If an adhesive is used, the type and amount of adhesive, the way of application (full area, dots or waves) and curing are important. An adhesive may fail (and the product may become partly or fully detached from its support) or contribute to the fire.

Warping of the specimen in the specimen holder may change the distance from the burner and thus affect the exposure during the test. The clamping technique used may be critical for thin and flexible products.

The specimen holder can have a “heat sink” effect or the screws in the frame can impede flame spread in the case of multilayer products with flame spread on vertical edge (see EN ISO 11925-2, section 7.3.3.2.3 and FSG recommendation 106).

The method of fixing should be specified. It should consist of at least the composition, type, size, position and number of fixings.

If mechanical fixings are used, care should be taken that the fixings do not interfere with the flame application or with potential flame spread.

4.3.8 Mounting and fixing for specific products and/or applications

For several types of products and/or applications additional M&F guidance is needed:

- in situ formed products;
- linear products.

5 Principles to get a classification of a group of products

Reference is made to prCEN/TS 15177:2004 guidance on direct and extended application.

5.1 General

Products come in a variety of properties, which could have an influence on its reaction to fire behaviour and the classification results.

In order to limit the amount of testing to a reasonable amount it can be useful to group products together which have a reaction to fire behaviour which would classify them in the same class.

Product properties which could influence the performance in a test can be:

- composition;
- density/area weight;
- colour;
- thickness;
- surface structure;
- surface coating/facings.

Also end use parameters as shown in table 2 can influence the grouping of products.

5.2 EN ISO 1182

As this is a material test rather than a product test, many specific product characteristics will not influence the results. Therefore products with different thickness, surface structure and surface coating/facings can be grouped.

5.2.1 Composition

As the composition affects the test results, grouping of products with different composition will generally not be possible. The total organic content, but also the nature and distribution of the organic material will be important. Products with varying organic contents, of otherwise constant type and distribution, can be grouped.

5.2.2 Density

Products of different density can be grouped. At least the highest and the lowest density need to be tested even if the process to achieve the different density does not influence the organic content or the distribution of organic material.

5.3 EN ISO 1716

Like EN ISO 1182, this is a material test rather than a product test, and many specific product characteristics will not influence the results. Therefore products with different thickness, surface structure and surface coating/facings can be grouped.

As the composition affects the test results, grouping of products with different composition will generally not be possible. The total organic content, but also the nature (regarding the calorific value) of the organic material will be important. If proper sampling is possible (not always obvious regarding the size of the test specimen, and sometimes the size of the organic component, e.g. binder distribution in mineral wool), the distribution will not play a role. Products with varying organic contents, of otherwise constant type can be grouped. The results of the product with the highest organic content will be representative of the product group. In general the calorific value of the components will roughly be known, which can allow a wider grouping, taking into account the combination of calorific value and content to define the worst case product (the product with the highest value) within a group.

Products of different density can be grouped if the process to achieve the different density does not influence the organic content.

Colour should not influence the test results except through organic content, and type of organic.

5.4 EN 13823 (SBI)

This test is to characterise the reaction to fire behaviour of a product in its end-use application. It will therefore be very difficult to give general guidance on grouping of products. Per product characteristic guidance is given on how to group products for achieving the optimum field of application.

Very generally, the test results will be determined by 2 aspects of the product burning behaviour: its initial response upon exposure to the heat source (determining FIGRA and SMOGRA values), and the response upon prolonged exposure, determining the THR and TSP values, and possibly the criteria regarding RHR and temperature to define end-of-test conditions.

With the main material properties (especially the inherent flammability) remaining the same, the initial response will be influenced by the thermal inertia ($\lambda \cdot \rho / C_p$) of the material. This property will determine whether heat can be dissipated away from the surface or whether a fast heating (and subsequent burning) of the combustion zone will be achieved. This is one concept which can help to decide grouping of products.

5.4.1 Composition

The composition will be decisive in determining the test results, and grouping of products will be very difficult, and can probably only be done in very specific cases.

5.4.2 Density

Even if the density variations can be achieved at identical product composition, this will influence the thermal inertia of the product. Products with different density (at identical composition) can be grouped. As the relationship between density and heat conductivity might be complex, in practice at least both the lowest and highest density products within a group need to be tested, unless a worst case density for a product family has been identified.

5.4.3 Colour

Colour will mainly influence the heat absorption, but the additional pigment system could possibly influence the burning behaviour as well. If differently coloured products are tested within a test series, and the results are within the statistical variation as defined in the test standard, it can be assumed that the colour does not influence the classification results (within the limits of the system used) and the results can be taken as valid for the product (group) tested.

5.4.4 Thickness

Thickness will influence the size of the heat sink, and will influence the amount of material which can contribute to the test results. As these effects are opposed to each other, grouping of products with different thicknesses is not possible over a large range. At the low end of the range (thin products), increasing thickness will give worse results due to more material contributing; at the high end, a larger thickness will not give worse results, and if phenomena like burn-through are prevented by larger thickness the results can improve. Within an envisaged group a similar behaviour of all products has to be demonstrated. Only when the products show (in the test) sufficiently similar behaviour can grouping be done.

5.4.5 Surface structure

The surface structure will influence the heat absorption, and by the increased surface it will also increase the reaction of the material. In principle, worse results can be expected. Products with different surface structure could be grouped; if differently textured products are tested within a test series, and the results are within the statistical variation as defined in the test standard, it can be assumed that the surface structure does not influence the classification results (within the limits of the system used) and the results can be taken as valid for the product group tested. Otherwise the different structures each have to be tested completely, or the worst results will be representative for the group.

5.4.6 Surface coating

Two possibilities can be discerned; the coating is an integral part of a product, or it is added later on, optionally. In the first case it can be regarded similarly to facings. In the second case it can be applied to a standard substrate as defined in the EN 13238, or to a specific substrate (product). If the coating is applied to a specific product as an optional treatment, the effect of applying a coating can be tested on a grouping previously defined, where the test results of the coated product can be considered valid for the entire group. Different variations (thickness, colour, combination of primer and topcoat) of the same type of coating can be grouped.

5.4.7 Facing

For grouping purposes, facings can be regarded as a product on a substrate. When grouping different products, with different facings, the reasoning given above should be followed.

5.4.8 Substrate

Similarly to the thickness, the presence of a substrate or air gap as part of the product configuration will influence the reaction to fire behaviour of the test specimen. When grouping products, this should be taken into account.

Example; when the product itself is an insulation product, the effect of additional insulation behind the main product will have a limited influence. If the main product does not burn through at a certain thickness, products with the same or higher thickness can be grouped, with and without additional insulation and/or air gaps

5.5 EN ISO 9239-1

This test is also designed to characterise the reaction to fire behaviour of a (flooring) product in its end-use application. The testing standard and EN 13238 already give clear guidance on some aspects of the product regarding the use of substrates and underlayment, and adhesive.

5.5.1 Thickness

Grouping of products can be done for products of similar composition, but different thickness.

In the practical thickness range for flooring products, a regular relationship between thickness and test results is expected. Testing both lowest and highest thickness can be representative for the results of the group (as already described in the product standard).

5.5.2 Surface structure, colour/pattern

The colour and surface structure will influence the heat absorption, and can increase the reaction of the material. Products with different surface structure and/or colour patterns could be grouped; if differently textured/coloured products are tested within a test series, and the results are within the statistical variation as defined in the test standard, it can be assumed that the surface structure/colour does not influence the classification results (within the limits of the system used) and the results can be taken as valid for the product group tested. In order to cover sufficient variations of texture and colour, it might be advisable to extend the number of tests beyond the prescription in the test standard. If the results with the selected structures/colours are not within the

statistical limits of the test standard, each will have to be tested completely, or the worst results will be representative for the group.

5.5.3 Coating

A coating for floorings can be tested on standard substrates (as defined in the EN 13238), or it can be tested on a specific (group of) (wood) flooring products. In the latter case, the effect of applying a coating can be tested on a grouping previously defined where the test results of the effect of applying a coating to the product can be considered valid for the entire group.

5.6 EN ISO 11925-2 (small flame)

The results will be determined by the product's (material's) inherent flammability, and by the other product properties like thickness, density, colour/structure, substrates, and facings.

5.6.1 Density

The density of the product will have an influence of the test results. Grouping could be based on test results from the highest density and the lowest density of the sample, unless a worst case density has been identified for a product family.

5.6.2 Thickness

The thickness of the product will have an influence of the test results. Grouping could be based on test results from the thickest and the thinnest sample, unless a worst case thickness has been identified for a product family.

5.6.3 Colour, surface structure

The colour and surface structure will influence the heat absorption, and can increase the reaction of the material. Products with different surface structure and/or colour patterns could be grouped; if differently textured/coloured products are tested within a test series, and the results are within the statistical variation as defined in the test standard, it can be assumed that the surface structure/colour does not influence the classification results (within the limits of the system used) and the results can be taken as valid for the product group tested. If the results with the selected structures/colours are not within the statistical limits of the test standard, each will have to be tested completely, or the worst results will be representative for the group.

5.6.4 Facing

For grouping purposes, facings can be regarded as a product on a substrate. When grouping different products, with different facings, the facings will be considered as thin products.