



TECHNICAL REPORT

Reaction to fire requirements for small components

TR 021
Edition June 2005

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Foreword

EOTA Technical Reports are developed as supporting reference documents to European Technical Approval Guidelines (ETAG) and can also be applicable to a Common Understanding of Assessment Procedures (CUAP), an EOTA Comprehension Document or an European Technical Approval, as far as reference is made therein.

EOTA Technical Reports go into detail in some aspects and express the common understanding of existing knowledge and experience of the EOTA Bodies at a particular point in time.

Where knowledge and experience is developing, especially through approval work, such reports can be amended and supplemented.

When this happens, the effect of the changes upon the European Technical Approval Guidelines will be laid down in the relevant Comprehension Documents, unless the European Technical Approval Guideline is revised.

REACTION TO FIRE REQUIREMENTS FOR SMALL COMPONENTS

Introduction

It should be noted that in some Member States (e.g. Germany) minimum requirements exist for the reaction to fire behaviour of construction products. Therefore, the rules and conditions for the assessment of the reaction to fire performance must always be considered in the ETAG/CUAP in order to cover cases where a reaction to fire classification is required and to guarantee a harmonised treatment of the product. However, the product need only be tested and classified in accordance with these rules when its use is intended in those Member States where requirements exist.

The requirements may be addressed to structural elements, to internal layers of the elements, to the surfaces of linear areas (e.g. surface claddings) or to very localised areas of products, e.g. to fixings or joints. Minor components, being insignificant in respect to the development of a fire, can be neglected and need not be tested in respect of their reaction to fire performance. The relevance of these products e.g. in respect of their contribution to fire spread needs to be considered in ETAG's/CUAP's. The assessment of whether a product can be neglected in this respect and the way this question has been addressed by the ETAG/CUAP writers, needs to be specified in the ETAG/CUAP.

In addition, the reaction to fire behaviour for complex products such as kits, with many different components, must be assessed even though it might not be possible to test the assembled kit as such in the test apparatus. Therefore, a detailed look at the different components of the kit is necessary, to define which components need to be tested separately and which components are, in their end use, so small as to be negligible. In other words, their contribution to fire spread is not of concern nor is an influence expected on the fire behaviour of the neighbouring material.

EOTA PT4 has prepared this document, to provide guidance on (1) the need to specify reaction to fire requirements for small areas/components and (2) on the assessment whether testing is required.

1 General

When assessing a component and its contribution to fire growth a distinction has to be made between structural elements which have to fulfil, in addition, resistance to fire requirements and elements which have to fulfil only reaction to fire requirements. For elements where the fire resistance performance is dependent on e.g. small fixing structures, the reaction to fire performance of the components cannot normally be neglected. The whole element, with the fixings, must be tested with respect to resistance to fire. Reaction to fire performance for the fixing components has also to be fulfilled when required.

In this case, small surfaces or components of products could only be considered as negligible when a contribution to fire propagation is clearly not expected. ETAG/CUAP writers should, therefore, take a close look at the possible fire development of the product and its behaviour under the conditions of its end use situation. ETAG/CUAP writers should reflect on how the fire behaviour of the single small component could develop.

The same approach of careful consideration, whether the end use is such that fire development is expected or not, has to be taken for components where reaction to fire requirements exist.

2 Definition

2.1 Small components

A component, which is not class A1/A2, need not to be tested and classified separately when it has, in end use application, such a small size or small surface/area that a contribution to fire growth or (in a fully developed fire) a contribution to smoke development and/or the production of flaming particles/droplets from this material, are not expected. It can be assumed that a component with a mass ≤ 50 g and a size of ≤ 50 mm x ≤ 50 mm is a small component/surface, which not need to be tested and classified separately.

Examples: Fillings of small hollow spaces; fixings such as screws, (plastic) anchors, staples, clips, nails, bolts and nuts, rivets having parts/components which are not class A1 (e.g. surface coatings, plastic washers); plastic caps of screws or anchors.

Components not considered as small components/small areas/small surfaces/insignificant need to be tested and classified according to EN 13501-1.

2.2 Small surface/area

For a small component, which is not class A1/A2, fulfilling the requirements of 2.1 above (e.g. plastic caps of anchors or fillings of small hollow spaces) forming part of a composite product and situated on the surface of a product made of material classes B, C, D or E, separate testing and classification is not necessary when similar components are at a distance of more than 200 mm. The risk of fire spread coming from the small component is not a concern.

On the other hand, the reaction to fire class of the composite can be influenced by the small component. The composite therefore has to be tested and classified as a whole.

3 Assessment of the reaction to fire performance

3.1 General

The reaction to fire performance of construction products has to be considered in ETAG's/CUAP's. The fire performance of the product and/or component shall be expressed in terms according to the Model Clauses concerning fire performance behaviour in ETAG's/CUAP's:

The product and/or individual kit component, as appropriate shall be tested, using the test method(s) relevant for the corresponding reaction to fire class, in order to be classified according to EN 13501-1:2002.

Normally the reaction to fire performance of a product or a kit component shall always be tested in order for it to be classified according to EN 13501-1.

Due to the fact that minimum requirements exist, in some Member States, for all construction products the ETAG/CUAP writer has to assess the need for specifying every single component of a kit product and to state which small components might satisfy the requirements without the need for testing.

For the assessment of the fire risk of components with small area/surface the question whether the material, when ignited, can develop fire spread on the surface or into the interior of the product, has to be answered.

3.2 Linear Joints

Linear joints e.g. in or through walls or floors or between building elements or jointing extending over the whole façade of a building might have small sizes on the surface of the elements but can contribute to fire propagation. Fire spread through the linear jointing material on the surface of the

element or the façade or into the interior is of concern. Therefore, joints generally **cannot** be considered as products having small areas and/or surfaces.

In view of this, products for linear joints may have to fulfil reaction to fire performance requirements and have to be tested and classified according to EN 13501-1 when their application is intended in those Member States where such requirements exist.¹ For these cases, the conditions for testing and classification of the products have to be considered in the ETAG/CUAP.

3.3 Embedded/non-embedded small components

Small connecting parts within a product consisting of various components might be not able to ignite or to propagate fire due to the special end use situation. In this case the context of the end use application should be assessed.

A small component embedded all-round in material of class A1 can be considered in the context of end use application to satisfy any reaction to fire requirement. This end use situation has to be assured during the working life of the construction.²

A small component embedded in or on the surface of a construction product which is not class A1 has to be assessed to determine whether the end use application is such that the reaction to fire class of the surrounding material is not influenced. Separate testing and classification of the small component is not necessary when an influence is not of concern.³

4 Method of assessing and judging

The ETAG/CUAP should indicate which product or which components of the product are regarded as small components as described in 2.1 that do not, therefore, need to be tested. The way in which the small component is incorporated in the product and how the product is installed or applied are to be specified in the ETA. The product may have different end use applications and it is possible that it

¹ In Germany linear joints as described in 3.2 have to fulfil minimum requirements and have to be classified at least class E. For special end use situations products have to be classified class A1 or A2. Jointing products for other applications e.g. in penetration seals, have, in Germany, to be at least class E. A higher performance is not required.

² **Example:** Metal anchors.
When considering metal anchors, with their different parts and components, and the influence of the fire behaviour of the surrounding product, the metal parts of such anchors (torque-controlled expansion anchors, undercut anchors, deformation-controlled expansion anchors) can be assumed to satisfy the requirements for Class A1 of the characteristic reaction to fire, in accordance with the provisions of EC Decision 96/603/EC (as amended) without the need for testing on the basis of its listing in that Decision.
The minor non-loadbearing plastic parts of anchors or any coating (e.g. coating of the cone) are located near the inner end of the anchor and these parts are completely embedded in the concrete for the end use application in the construction. Furthermore, the plastic parts and the coating are very thin. Therefore it may be assumed that these parts in connection with the metal anchor in the end use application do not make any contribution to fire growth or to the fully developed fire and they have no influence to the smoke hazard.
In the context of end use application of the anchorages the plastic parts and the coating can be considered to satisfy any reaction to fire requirements.

³ **Example:** Plastic anchors for use in concrete and masonry.
When considering plastic anchors, with their different parts and components and the influence of the fire behaviour of the surrounding product, the metal parts of such anchors can be assumed to satisfy the requirements for Class A1 of the characteristic reaction to fire, in accordance with the provisions of EC Decision 96/603/EC (as amended) without the need for testing on the basis of its listing in that Decision.
The anchorages are used to fix a cladding or component which is not class A 1 and the plastic parts of the anchor are located in the drilled hole of the base material (concrete or masonry) and fixture. Where the plastic parts of the anchor are embedded in concrete or masonry it may be assumed that these plastic parts do not make any contribution to fire growth or to the fully developed fire and they have no influence to the smoke hazard. In the context of this end use application the plastic parts embedded in concrete/masonry can be considered to satisfy any reaction to fire requirements.
Where the plastic parts of the anchor are embedded in the cladding/component, which is not class A 1 the plastic parts can be considered not to influence the reaction to fire class of the cladding/component.

may be regarded as a small component only for one application. The description in the ETAG/CUAP should provide a clear handling procedure for the Approval Body, including the way to assess the product, or the constituent of the product, as small components. The Approval Body should identify in the ETA which product was regarded as a small component that did not need to be tested.

5 Conclusions

ETAG/CUAP writers should consider all components of construction products in respect of their size and end use condition and should state for every product or component its relevance or non-relevance in relation to the reaction to fire performance. They should seek advice from EOTA PT4 regarding their considerations in respect of small components/areas/surfaces.