



TECHNICAL REPORT

Reaction to fire requirements  
for small components

TR 021

June 2005

Amended June 2020

## Contents

<b>1. SCOPE .....</b>	<b>3</b>
1.1. Introduction.....	3
1.2. General .....	3
<b>2. SPECIFIC TERMS/SYMBOLS USED IN THIS TR.....</b>	<b>4</b>
<b>3. DEFINITIONS .....</b>	<b>4</b>
3.1. Small components .....	4
3.2. Small surface/area.....	4
<b>4. GUIDANCE FOR THE ASSESSMENT OF THE REACTION TO FIRE PERFORMANCE .....</b>	<b>5</b>
4.1. General .....	5
4.2. Linear joints .....	5
4.3. Embedded/non-embedded small components.....	5
<b>5. INFORMATION IN EAD/ETA .....</b>	<b>6</b>
<b>6. CONCLUSIONS.....</b>	<b>6</b>
<b>7. REFERENCE DOCUMENTS.....</b>	<b>6</b>
<b>ANNEX I.SYNOPSIS OF ASSESSMENT APPROACH .....</b>	<b>7</b>

## **1. SCOPE**

### **1.1. Introduction**

Whereas in some Member States minimum requirements exist for the reaction to fire behaviour of construction products, the rules and conditions for the assessment of the reaction to fire performance must always be considered in the EAD when a reaction to fire classification is required and to guarantee a harmonized 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.

This TR is intended to provide just guidance on decisions whether small components may be tested for reaction to fire or not.

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 localized areas of products, e.g. to fixings or joints. Minor components, classified as insignificant with respect to the development of a fire according to Annex I, 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 the EAD.

In addition, the reaction to fire behaviour for complex products such as kits, with many different components, may be assessed in such way that comparison is possible whether the performance complies with the relevant requirements of the Member States. 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 to be considered as negligible. In other words, their contribution to fire spread is not of concern nor has an influence expected on the fire behaviour of the neighbouring material.

The contribution to resistance to fire of small components is not covered by this TR.

### **1.2. General**

For reaction to fire, small surfaces or components of products could only be considered as negligible when a contribution to fire propagation is clearly not expected. EAD 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. EAD writers should reflect on how the single small components could behave in case of fire.

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. This TR can be used as orientation when implementing criteria for the assessment of the reaction to fire performance of small areas/components in an EAD. This TR does not pretend to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this technical report to establish appropriate safety practices and determine the applicability of regulatory limitations prior to use.

Linear joints generally cannot be considered as products having small areas and/or surfaces and are out of the scope of this TR.

## 2. SPECIFIC TERMS/SYMBOLS USED IN THIS TR

A1, A2, B, C, D, E, F	Expressions of euro classes according to EN 13501-1:2018
-----------------------	--

## 3. DEFINITIONS

### 3.1. Small components

A component not classified as A1/A2, does not need to be tested and classified separately if, for an end use application, has such a small weight, 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  $\leq 50$  g and a size of  $\leq 50$  mm x  $\leq 50$  mm or a diameter of  $\leq 57$  mm is a small component/surface, which needs not to be tested and classified separately<sup>1</sup>. 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<sup>2</sup> according to EN 13501-1:2018, considering all variants of these types of components.

### 3.2. Small surface/area

For a small component, which is not of the class A1/A2, fulfilling the requirements of 3.1 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, E or F, separate testing of the product considering all variants of these small components, and classification is not necessary when components of the same kit/system or similar nature 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.

---

<sup>1</sup> Nevertheless, it shall be included in the test samples if necessary (e.g. according to end use-mounting and fixing conditions for SBI test, etc).

<sup>2</sup> According to Commission Delegated Regulation (EU) 2016/364 in combination with EN 13501-1:2018.

## **4. GUIDANCE FOR THE ASSESSMENT OF THE REACTION TO FIRE PERFORMANCE**

### **4.1. General**

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

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<sup>2</sup> according to Standard EN 13501-1:2018 considering all variants of these types of components.

Normally the reaction to fire performance of a product or a kit shall always be tested in order to be classified<sup>2</sup> according to EN 13501-1:2018. Due to the fact that minimum requirements exist in some Member States, for all construction products the EAD writer has to follow these requirements and identify components which might satisfy the requirements without the need for testing.

### **4.2. 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.

### **4.3. Embedded/non-embedded small components**

Small connecting parts within a product consisting of various components might be unable 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<sup>3</sup>. 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<sup>4</sup>.

---

<sup>3</sup> 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.

<sup>4</sup> Example: Plastic anchors for use in concrete and masonry.

## 5. INFORMATION IN EAD/ETA

The EAD should indicate which components of the product are regarded as small components as described in 3.1 that do not, therefore, need to be tested. The product may have different end use applications and it is possible that it may be regarded as a small component only for one application. The description in the EAD should provide a clear handling procedure for the Technical Assessment Body, including the way to assess the product, or the constituent of the product, as small components. The Technical Assessment Body should identify in the ETA which of components or elements of the product are regarded as a small component that did not need to be tested.

A small component is considered as such when it satisfies all the following requirements:

- not made from class A1/A2 material,
- a mass  $\leq 50$  g,
- a size of  $\leq 50$  mm  $\times$   $\leq 50$  mm or a diameter of  $\leq 57$  mm (equal area size as for a rectangular size of  $\leq 50$  mm  $\times$   $\leq 50$  mm) and
- a distance  $\geq 200$  mm to similar components when:
  - o is forming part of a composite product) and being situated on the surface of a product made of material of classes B, C, D, or E,
  - or
  - o is completely embedded all-round in non-melting material of class A1 when used as small connecting part of a product consisting of various components and without any possibility to ignite or to propagate fire.

Where the conditions are not met regarding the distance to other similar components or the all-round covering by non-melting A1 materials, the component shall be tested as part of the relevant composite product. The ETA shall state which components are considered as small components, where the reaction to fire performance can be seen as negligible. A synopsis of the assessment approach is presented in Annex I.

## 6. CONCLUSIONS

EAD 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.

## 7. REFERENCE DOCUMENTS

EN 13501-1:2018	Fire classification of construction products and building elements - Part 1: Classification using data from reaction to fire tests
Commission Delegated Regulation (EU) 2016/364 of 1 July 2015	The classification of the reaction to fire performance of construction products pursuant to Regulation (EU) No 305/2011

## ANNEX I. SYNOPSIS OF ASSESSMENT APPROACH

