



TECHNICAL REPORT

Provisions for the determination of
construction products' propensity to
undergo continuous smouldering in
EADs

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PROVISIONS FOR PROPENSITY TO UNDERGO CONTINUOUS SMOULDERING IN EADS

1 INTRODUCTION

This document has been developed by EOTA PT4 with the aim of ensuring consistency of the paragraphs dealing with the essential characteristic “Propensity to undergo continuous smouldering” in EADs. The characteristic is required in some member states and is only relevant for factory made or in-situ applied construction products or components of kits which are completely (homogenous products) or in parts (non-homogenous / composite products) made of wood-based materials, cork, mineral wool, wood wool / wood chips, wood fibres or any other vegetable fibres (than wood fibres) or animal fibres.

The assessment of this characteristic needs to be performed in accordance with EN 16733, but according to clauses 1 and 12 of this test standard, additional provisions regarding mounting and fixing of test specimens as well as extended application of test results need to be included in the harmonised technical specification, i.e. the harmonised product standard or the EAD. Although this is being expected in due time, for the time being, not all relevant harmonised product standards address “Propensity to undergo continuous smouldering”.

Consequently, EADs need to foresee all relevant provisions, which apply until the relevant harmonised product standard covers this characteristic.

In the model clauses, guidance for EAD writers is given as text between “[...]”.

The document distinguishes 2 cases:

- The EAD covers one of the products referred to above (see section 2.1)
- The EAD covers a kit, comprising one or more of the products referred to above (see section 2.2)

This characteristic is part of the reaction to fire behaviour of products. The AVCP system, which applies for reaction to fire, applies for this characteristic as well.

Note: When a first document including this issue of Propensity to undergo continuous smouldering will be sent to EC, the feedback on AVCP will be clarified, because the Delegated Act is not yet published (September 2019)

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2 MODEL CLAUSES FOR EAD**2.1 EADs covering a factory made or in-situ applied construction product, made out of materials as defined in clause 1****EAD clause: 2.2.X. Propensity to undergo continuous smouldering**

The performance of the product's propensity to undergo continuous smouldering shall be tested and assessed in accordance with EN 16733.

The conditions and parameters which shall be taken into account within the test as well as the rules for the application of the test results are specified below / in Annex ...

[Choose the relevant clauses in annex, depending on the material the product in question is made out of.]

[If an existing applicable harmonised technical specification (hEN or EAD) already foresees the necessary clauses, reference should be made from the EAD to that harmonised technical specification.]

In accordance with EN 16733:2016, clause 11, the ETA shall specify the following information, depending on the out-come of the assessment:

- *“The product does not show propensity to undergo continuous smouldering”;*
- *“The product shows propensity to undergo continuous smouldering” or*
- *“Assessment of the propensity to undergo continuous smouldering is not possible”.*

2.2 EADs covering a kit, comprising one or more factory made or in-situ applied construction product, made out of materials as defined in clause 1**EAD clause 2.2.X. Propensity to undergo continuous smouldering**

In case of a kit comprising one or more components made of any of the aforementioned materials the propensity to undergo continuous smouldering of the concerned kit component(s) shall be tested and assessed in accordance with EN 16733.

[Choose the relevant clauses in annex, depending on the material the product in question is made out of.]

[If an existing applicable harmonized technical specification (hEN or EAD) already foresees the necessary clauses, reference should be made from the EAD to that harmonised technical specification.]

In accordance with EN 16733:2016, clause 11, the ETA shall specify the following information, for the kit component(s) in question, depending on the out-come of the assessment:

- *“The product does not show propensity to undergo continuous smouldering”;* or
- *“The product shows propensity to undergo continuous smouldering” or*
- *“Assessment of the propensity to undergo continuous smouldering is not possible”.*

Note: In specific cases it might be necessary to express the propensity to undergo continuous smouldering of a kit as whole (e. g. ETICS). In case the assembly of the kit requires bonding or fastening one or more components, for which the propensity to undergo smouldering is relevant, into a composite system, the performance of the kit shall be considered as the same as the determined performance of the relevant kit component(s). The ETA shall therefore specify the performance of the kit in the same way as for the assessed component. In case of several components to be tested and assessed the most onerous performance of these components shall apply for the characterization of the performance of the kit. Depending on the outcome of the assessment, the ETA shall specify the following information for the entire kit:

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- *"The kit does not show propensity to undergo continuous smouldering", or*
- *"The kit shows propensity to undergo continuous smouldering",*
- *"Assessment of the propensity to undergo continuous smouldering of the kit is not possible".*

2.3 References

EAD clause: 4 Reference documents

EN 16733:2016 Reaction to fire tests for building products - Determination of a building product's propensity to undergo continuous smouldering.

Other standards, depending on specific material (see annexes).

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3 ADDITIONAL MODEL PROVISIONS (FOR EAD ANNEXES) FOR EACH MATERIAL THE CONSTRUCTION PRODUCT IS MADE OUT OF

[Note: The following clauses provide examples for the implementation of appropriate rules when drafting EADs with regard to the determination of propensity to undergo continuous smouldering of the most typical products for which this characteristic may be relevant. However, depending on the specific product in question for which an EAD is under development these example provisions may need modification.]

3.1 Provisions for factory-made products made of mineral wool¹

Model clauses for EAD Annex:

A.x Provisions for factory-made products made of mineral wool

A.x.1 Sample taking

In addition to EN 16733, the following conditions and parameters shall be considered when performing sampling and preparing test samples:

- the product-variations of a product family (as defined by a certain combination of raw materials and other additives and produced in a certain production process)²;
- the product or product variant with the highest organic content (in percentage per mass), determined according to EN 13820;
- the product or product variant with the highest density as well as a density of about 100 kg/m³ ($\pm 15\%$); if the highest density is lower than 115 kg/m³, then only the product or product variant with the highest density. (density determined in accordance with EN 1602);
- the product or product variant with the highest thickness. If the highest thickness is greater than 100 mm, then the specimen thickness shall be reduced from the reverse (non-exposed) side to the maximum testable thickness of about 100 mm. (thickness determined in accordance with EN 823 on at least three specimens).
- each different produced fibre orientation, i.e. lengthwise and crosswise to the length direction of the specimen as well as perpendicular to the surface of the specimen front side;
- without any facings, coatings (or similar) – existing facings or coatings shall be removed when preparing the test specimens.

A.x.2 Preparation of test specimen

The tests shall be done on free-hanging specimens without consideration of the intended end-use conditions, because propensity to undergo continuous smouldering is hardly affected by end-use conditions, and without any joints (see further).

If the product/kit component is only available in lengths lower than 800 mm, the test specimens shall be prepared by using two (or more) smaller pieces of the mineral wool, which shall be put together with a butt joint. This joint shall be positioned in the maximum possible distance to the bottom edge of the test specimens. Connection of the pieces of the test specimens shall be carried out in such a manner that a permanent and close contact is ensured between both pieces at the joint for the entire testing and monitoring time.

¹ For products made of mineral wool fibres and aerogel the same provisions shall apply as given in clause 3.1 for factory-made products made of mineral wool.

² To permit the TAB to apply EXAP-rules, the manufacturer should provide sufficient information (e. g. on the basis of the composition of the products in question), allowing the TAB to determine which products or product variants shall be submitted to testing.

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[Alternatively to the aforementioned para the following wording can be used:

If the paragraph 6.2.5 of EN 16733 applies, a permanent contact between the pieces shall be assured.]

A.x.3 Extended application of test results

The test results considering the aforementioned parameters are also valid for products:

- of the same defined product- family,
- with lower organic content,
- with all lower densities,
- with lower thickness and also with higher thickness when 100 mm thick specimens were tested,
- with all fibre orientations,
- with any facings or coatings and
- for any end-use conditions.

3.2 Provisions for factory-made products made of cork**Model clauses for EAD Annex:****A.x Provisions for factory-made products made of cork****A.x.1 Sample taking**

In addition to EN 16733, the following conditions and parameters shall be considered when performing sampling and preparing test samples:

- product-variations of a product family (as defined by a certain combination of raw materials, e. g. type of binder and additives etc., and produced in a certain production process);²
- the product or product variant with the highest and lowest density, determined by tests according to EN 1602;
- the product or product variant with the highest thickness, determined by tests according to EN 823 on at least three specimens;
- each different produced orientation, if relevant (i. e. lengthwise and crosswise to the length direction of the product);
- without any facings, coatings or suchlike – existing facings or coatings shall be removed when preparing the test specimens.

A.x.2 Preparation of tests specimens

The tests shall be done without consideration of the intended end-use conditions, because propensity to undergo continuous smouldering is hardly affected by end-use conditions. If the paragraph 6.2.5 of EN 16733 applies, a permanent contact between the pieces shall be assured.

A.x.3 Extended application of test results

The results of tests considering the aforementioned parameters in fully are also valid for products:

- of the same defined product-family,
- with all densities between those evaluated,
- with lower thickness and also with higher thickness when 100 mm thick specimens were tested,
- with all orientations, if all relevant orientations (lengthwise and crosswise) had been tested,
- with any facings or coatings or suchlike and
- for any end-use conditions.

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3.3 Provisions for factor-made products made of wood fibre

*Model clauses for EAD Annex:***A.x Provisions for factory-made products made of wood fibre****A.x.1 Sample taking**

In addition to EN 16733, the following conditions and parameters shall be considered when performing sampling and preparing test samples:

- product-variations of a product family (as defined by a certain combination of raw materials, e.g. type of binder and additives, and produced in a certain production process)²;
- wood type of the wood fibres;
- type of production process;
- the product or product variant with the highest and lowest density, determined by tests according to EN 1602;
- the product or product variant with the highest thickness, determined by tests according to EN 823 on at least three specimens;
- each different produced fibre orientation (i. e. lengthwise and crosswise to the length direction of the product);
- without any facings, coatings or suchlike – existing facings or coatings shall be removed when preparing the test specimens.

A.x.2 Preparation of tests specimens

The tests shall be done without consideration of the intended end-use conditions, because propensity to undergo continuous smouldering is hardly affected by end-use conditions. If the paragraph 6.2.5 of EN 16733 applies, a permanent contact between the pieces shall be assured.

A.x.3 Extended application of test results

The results of tests considering the aforementioned parameters in fully are also valid for products:

- of the same defined product-family (as defined by e.g. binder type and additives, wood type of the fibres, including the production process),
- with all densities between those evaluated,
- with lower thickness and also with higher thickness when 100 mm thick specimens were tested,
- with all fibre orientations, if all relevant orientations had been tested,
- with any facings or coatings or suchlike,
- for any end-use conditions.

3.4 Provisions for factory-made products made of wood wool or wood chips

*Model clauses for EAD Annex:***A.x Provisions for factory-made products made of wood wool or wood chips****A.x.1 Sample taking**

In addition to EN 16733, the following conditions and parameters shall be considered when performing sampling and preparing test samples:

- a) Homogeneous products
 - product-variations of a product family (as defined by a certain combination of raw materials, e.g. the type of wood, binder and additives, and produced in a certain production process)²;

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- the product or product variant with the highest organic content (in percentage per mass), determined according to EN 13820;
- the product or product variant with the highest density as well as the lowest density, determined by tests according to EN 1602;
- the product or product variant with the highest thickness or – if greater than 100 mm – highest testable thickness of 100 mm, determined according to EN 823 on at least three specimens;
- each different produced orientation of the wood wool / wood chips (i. e. lengthwise and crosswise to the length direction of the specimen);
- without any facings, coatings or suchlike – existing facings or coatings shall be removed when preparing the test specimens

b) Non-homogeneous products (composite boards)

- product-variations of a product family (as defined by a certain combination of raw materials, e.g. the type of wood, binder and additives, possible combinations of wood wool / wood chips and other possible layer materials, and produced in a certain production process)²;
- the product or product variant with the highest as well as lowest density of the wood wool / wood chip layer;
- the product or product variant with the highest thickness of the wood wool / wood chip layer;
- each different produced orientation of the wood wool / wood chips and the fibres of the second layer in case of materials made of mineral wool, wood fibres, cork or any other animal or vegetable fibres (i. e. lengthwise and crosswise to the length direction of the specimen);
- the product or product variant with the highest organic content (in percentage per mass), determined by tests according to EN 13820;
- the product or product variant with the highest as well as lowest density of the second layer material, in case of combination with material which may also show propensity to undergo continuous smouldering (wood fibre, cork or materials made of any other vegetable or animals fibres);
- the product or product variant with the highest density as well as a density of about 100 kg/m³ ($\pm 15\%$) of the second layer in case the material is made of mineral wool; if the highest density of the range is equal or lower than 115 kg/m³, then only the product or product variant with the highest density. The density shall be determined in accordance with EN 1602);
- the product or product variant with the highest density of the second layer material, in case of combination with any other products which do not show propensity to undergo continuous smouldering;
- the product or product variant with the highest thickness of the second layer material, in case of combination with material which may also show propensity to undergo continuous smouldering (wood fibre, cork, mineral wool or materials made of any other vegetable or animals fibres) or
- the product or product variant with the lowest thickness of the second layer material, in case of combination with any other material which do not show propensity to undergo continuous smouldering.

A.x.2 Preparation of tests specimens

The tests shall be done on specimens taken from 2-layer-composite boards (with one external wood wool / wood chip layer), which also cover 3-layer composite boards (with two external wood wool / wood chip layers).

In case of composite boards made of wood wool / wood chips and second layer material which may also show propensity to undergo continuous smouldering (wood fibre, cork, mineral wool or materials made of any other vegetable or animals fibres), both layers shall be exposed by the ignition source within the tests. In case of composite boards made of wood wool / wood chips and any other second layer material, which do not show propensity to undergo continuous smouldering, only the wood wool / wood chip layer shall be exposed by the ignition source within the tests.

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The tests shall be done without consideration of the intended end-use conditions, because propensity to undergo continuous smouldering is hardly affected by end-use conditions. If the paragraph 6.2.5 of EN 16733 applies, a permanent contact between the pieces shall be assured.

A.x.3 Extended application of test results

The determined performance of the tested product shall be expressed in accordance with clause 11 of EN 16733. The results of tests considering the aforementioned parameters in fully are also valid for products:

- of the same defined product-family (as defined by e.g. type of wood, binder and additives),
- with lower organic content of the wood wool / wood chip layer,
- with all densities of the wood wool / wood chip layers between those evaluated,
- with lower densities in case of mineral wool as second layer material or in case of layer material which do not show propensity to undergo continuous smouldering,
- with all densities between those evaluated in case of wood fibre, cork or any other materials made of vegetable or animal fibres as second layer,
- with lower thickness of the wood wool / wood chip layer as well as of the second layer and also with higher thickness of the layers when the layer thickness of the tested specimen was of about 100 mm,
- with all orientations of the wood wool / wood chips and the second layer material in case of materials made of mineral wool, wood fibre, cork or any other animal or vegetable fibres,
- with any facings or coatings or suchlike and
- for any end-use conditions.

3.5 Provisions for factory-made products made of any other vegetable fibre (than wood fibre) or animal fibre

Model clauses for EAD Annex:

A.x Provisions for factory-made products made of any other vegetable fibre (than wood fibre) or animal fibre

A.x.1 Sample taking

In addition to EN 16733, the following conditions and parameters shall be considered when performing sampling and preparing test samples:

- product-variations of a product family (as defined by a certain combination of raw materials, e. g. type of fibres, type of binder and additives / treatment, and produced in a certain type of production process)²;
- the product or product variant with the highest and lowest density, determined by tests according to EN 1602;
- the product or product variant with the highest thickness, determined by tests according to EN 823 on at least three specimens;
- each different produced fibre orientation (i. e. lengthwise and crosswise to the length direction of the specimen);
- without any facings, coatings or suchlike – existing facings or coatings shall be removed when preparing the test specimens.

A.x.2 Preparation of tests specimens

The tests shall be done without consideration of the intended end-use conditions, because propensity to undergo continuous smouldering is hardly affected by end-use conditions. If the paragraph 6.2.5 of EN 16733 applies, a permanent contact between the pieces shall be assured.

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A.x.3 Extended application of test results

The results of tests considering the aforementioned parameters in fully are also valid for products:

- of the same defined product-family,
- with all densities between those evaluated,
- with lower thickness and also with higher thickness when 100 mm thick specimens were tested,
- with all fibre orientations, if all relevant orientations had been tested,
- with any facings or coatings or suchlike and
- for any end-use conditions.

3.6 Provisions for in-situ loose-fill products made of vegetable or animal fibres*Model clauses for EAD Annex:***A.x Provisions for in-situ loose-fill products made of vegetable or animal fibres****A.x.1 Sample taking**

In addition to EN 16733, the following conditions and parameters shall be considered when performing sampling and preparing test samples:

- product-variations of a product family (as defined by a certain combination of raw materials, e. g. type of fibres, type of binder and additives / treatment, and produced in a certain type of production process)²;
- the product or product variant with the highest as well as lowest bulk density, determined by tests according to EN 1097-3.

A.x.2 Preparation of tests specimens

The tests shall be done on free-hanging specimens using the specimen holder for loose-fill products as specified in the test standard (wire mesh box with a thickness of about 100 mm) without consideration of the intended end-use conditions, because propensity to undergo continuous smouldering is hardly affected by end-use conditions.

A.x.3 Extended application of test results

The results of tests considering the aforementioned parameters in fully are also valid for products:

- of the same defined product-family,
- with any bulk densities between those evaluated,
- with any thickness,
- for any end-use conditions.

3.7 Provisions for in-situ loose-fill products made of mineral wool fibres*Model clauses for EAD Annex:***A.x Provisions for in-situ loose-fill products made of mineral wool fibres****A.x.1 Sample taking**

In addition to EN 16733, the following conditions and parameters shall be considered when performing sampling and preparing test samples:

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- product-variations of a product family (as defined by a certain combination of raw materials, e. g. fibre type, type of binder and additives, and produced in a certain production process)²;
- the product or product variant with the highest organic content (in percentage per mass), determined according to EN 13820;
- the product or product variant with the highest as well as lowest bulk density and – if part of the bulk density range to be considered - a bulk density of about 100 kg/m³ ($\pm 15\%$), determined according to EN 1097-3).

A.x.2 Preparation of tests specimens

The tests shall be done on free-hanging specimens using the specimen holder for loose-fill products as specified in the test standard (wire mesh box with a thickness of about 100 mm) without consideration of the intended end-use conditions, because propensity to undergo continuous smouldering is hardly affected by end-use conditions.

A.x.3 Extended application of test results

The results of tests considering the aforementioned parameters in fully are also valid for products:

- of the same defined product-family,
- with lower organic content,
- with any bulk densities between those evaluated,
- for any thickness and
- for any end-use conditions.

3.8 Provisions for wood-based boards / panels*Model clauses for EAD Annex:***A.x Provisions for wood-based boards / panels****A.x.1 Sample taking**

In addition to EN 16733, the following conditions and parameters shall be considered when performing sampling and preparing test samples:

- product-variations of a product family (as defined by a certain combination of raw material, e. g. binder, additives, wood type of the wood shapes / wood fibres etc., and produced in a certain production process)²;
- the product or product variant with the highest as well as the lowest density of the wood-based board / panel, determined by tests according to EN 323;
- the product or product variant with the highest thickness of the wood-based board / panel, determined by tests according to EN 823 on at least three specimens;
- each different produced shape / fibre orientation (i. e. lengthwise and crosswise to the length direction of the specimen);
- without any external non-substantial facings, coatings or suchlike – existing external non-substantial facings or coatings shall be removed when preparing the test specimens

A.x.2 Preparation of tests specimens

The tests shall be done without consideration of the intended end-use conditions, because propensity to undergo continuous smouldering is hardly affected by end-use conditions. If the paragraph 6.2.5 of EN 16733 applies, a permanent contact between the pieces shall be assured.

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A.x.3 Extended application of test results

The results of tests considering the aforementioned parameters in fully are also valid for products:

- of the same defined product-family ,
- with all densities of wood-based boards / panels between those evaluated,
- with lower thickness of wood-based boards / panels and also with higher thickness when 100 mm thick specimens were tested,
- with all shape / fibre orientations, if all relevant orientations had been tested,
- with any external non-substantial facings or coatings or suchlike and
- for any end-use conditions.

[Note: The aforementioned provisions / model clauses of cl. 3.8 refer to homogenous boards / panels or non-homogenous boards / panels only with external non-substantial layers. In case of composite products consisting of wood-based boards / panels and further substantial layers, the provisions / model clauses given in cl. 3.4 may be used as orientation for the development of appropriate provisions.]

3.9 Provisions for materials with and/or without perforations of the surface*Model clauses for EAD Annex:***A.x PROVISIONS FOR MATERIALS WITH AND/OR WITHOUT PERFORATIONS OF THE SURFACE****A.x.1 Sample taking**

The following conditions and parameters shall be considered when performing sampling and preparing test samples:

- the product / product variant without perforations (closed surface) as well as with the highest and the lowest area of perforations (in percentage related to the surface area of the tested material);
- the product / product variant with highest and lowest diameter of perforations;
- the product / product variant with the highest distance between neighboured perforations.

A.x.2 Extended application of test results

The results of tests considering the aforementioned parameters in fully are also valid for products:

- without perforations of the surface,
- with all areas of perforations (in percentage related to the surface area of the material in question) between those evaluated,
- with all diameters of the perforations between those evaluated,
- with equal or lower distances between neighboured perforations.

[Note: The aforementioned provisions / model clauses of cl. 3.9 should be incorporated – where necessary - in the relevant model clauses given in clauses 3.1 to 3.8 depending on the material of which the product in question is made of.]