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European Assessment Document for

Fibreboards for
non-structural indoor uses
made of recycled cellulosic fibres
from industrial cellulosic residues



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This European Assessment Document (EAD) has been developed taking into account up-to-date technical and scientific knowledge at the time of issue and is published in accordance with the relevant provisions of Regulation (EU) No 305/2011 as a basis for the preparation and issuing of European Technical Assessments (ETA).

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1 SCOPE OF THE EAD

1.1 Description of the construction product

This EAD covers “Fibreboards for non-structural indoor uses made of recycled cellulosic fibres from industrial cellulosic residues”, hereinafter referred to as the “fibreboard”.

The fibreboard is made mainly of cellulosic fibres obtained from recycled industrial cellulosic residues, cellulosic fibres from recycled paper, cardboard, textile and vegetable cellulosic fibres and other additives (such as organic binders or fire retardants).

The main raw material (industrial cellulosic residues) cannot be recycled anymore by the paper industry, from where it comes, because the cellulosic fibres:

- are too short (less than 5 mm) to offer good mechanical properties to the final fibreboard and/or,
- are wrapped by impurities that do not allow proper chemical links between fibres.

To improve these fibres properties, an enzymatic process is carried out with the following objectives:

- Smoothing cellulose fibres.
- Increasing the specific surface of the fibres.
- Cleaning the fibres, separating them from impurities.

The internal bond of the fibreboard is derived from the inherent adhesive properties of cellulose fibres to bind each other by hydrogen bonds between hydroxyl groups. The fibreboard may contain an organic binder which also may contribute to the internal bond of the fibreboard. .

During the manufacturing of the fibreboards no phenolic resins nor pentachlorophenol are added.

Fibreboards thickness range covered by this EAD is from 3 mm to 35 mm.

Fibreboards may or may not be finished/covered with factory-made facings or coatings.

The fibreboard has shorter fibres and less (or no) binder is used, in comparison to other fibreboards which are not made of recycled cellulosic fibres from industrial cellulosic residues. To treat these fibres, an enzymatic controlled process is used, this enzymatic process is not considered in EN 13986¹.

The product is not fully covered by EN 13986:

- The following essential characteristic covered by EN 13986 does not apply:
 - Release (content) of pentachlorophenol (PCP). The fibreboard does not contain raw materials that include pentachlorophenol.
- The assessment methods of the following essential characteristics covered by EN 13986 do not apply:
 - Reaction to fire. Values of fibreboards defined in table 8 of EN 13986 do not apply.
 - Water vapour permeability. Values of fibreboards defined in table 9 of EN 13986 do not apply.
 - Sound absorption. Values of fibreboards defined in table 10 of EN 13986 do not apply.
 - Thermal conductivity. Values of fibreboards defined in table 11 of EN 13986 do not apply.

¹ All undated references to standards in this EAD are to be understood as references to the dated versions listed in clause 4.

- The following essential characteristics included in this EAD are not covered by EN 13986:
 - Propensity to undergo continuous smouldering.
 - Content, emission and/or release of dangerous substances (SVOC and VOC).
 - Tensile strength.
 - Dimensional stability.
 - Impact resistance.

Concerning product packaging, transport, storage, maintenance, replacement and repair it is the responsibility of the manufacturer to undertake the appropriate measures and to advise his clients on the transport, storage, maintenance, replacement and repair of the product as he considers necessary.

It is assumed that the product will be installed according to the manufacturer's instructions or (in absence of such instructions) according to the usual practice of the building professionals.

Relevant manufacturer's stipulations, e.g., with regard to the intended end use conditions, having influence on the performance of the product covered by this European Assessment Document shall be considered for the determination of the performance and detailed in the ETA, as long as the details of the assessment methods as laid down in this EAD are respected.

1.2 Information on the intended use(s) of the construction product

1.2.1 Intended use(s)

The product is intended to be used in non-structural internal building applications, such as ceilings, wall covering systems and partitions not subjected to water contact or wetting.

1.2.2 Working life/Durability

The assessment methods included or referred to in this EAD have been written based on the manufacturer's request to take into account a working life of the fibreboard for the intended use of 25 years when installed in the works. These provisions are based upon the current state of the art and the available knowledge and experience.

When assessing the product the intended use as foreseen by the manufacturer shall be taken into account. The real working life may be, in normal use conditions, considerably longer without major degradation affecting the basic requirements for works².

The indications given as to the working life of the construction product cannot be interpreted as a guarantee neither given by the product manufacturer or his representative nor by EOTA when drafting this EAD nor by the Technical Assessment Body issuing an ETA based on this EAD, but are regarded only as a means for expressing the expected economically reasonable working life of the product.

1.3 Specific terms used in this EAD

1.3.1 Specific surface of the fibres

Ratio between the total surface area and the volume of the fibres of a fibreboard.

² The real working life of a product incorporated in a specific works depends on the environmental conditions to which that works is subject, as well as on the particular conditions of the design, execution, use and maintenance of that works. Therefore, it cannot be excluded that in certain cases the real working life of the product may also be shorter than referred to above.

2 ESSENTIAL CHARACTERISTICS AND RELEVANT ASSESSMENT METHODS AND CRITERIA

2.1 Essential characteristics of the product

Table 2.1.1 shows how the performance of the fibreboard is assessed in relation to the essential characteristics.

Table 2.1.1 Essential characteristics of the product and methods and criteria for assessing the performance of the product in relation to those essential characteristics.

No	Essential characteristic	Assessment method	Type of expression of product performance
Basic Works Requirement 2: Safety in case of fire			
1	Reaction to fire	2.2.1	Class
2	Propensity to undergo continuous smouldering	2.2.2	Description
Basic Works Requirement 3: Hygiene, health and the environment			
3	Content, emission and/or release of dangerous substances: <ul style="list-style-type: none"> • SVOC and VOC • Release of formaldehyde 	2.2.3	Level
4	Water vapour permeability	2.2.4	Level
Basic Works Requirement 4: Safety and accessibility in use			
5	Bending strength and modulus of elasticity in bending	2.2.5	Level
6	Tensile strength	2.2.6	Level
7	Internal bond	2.2.7	Level
8	Dimensional stability	2.2.8	Level
9	Durability: swelling in thickness	2.2.9	Level
10	Durability: moisture resistance	2.2.10	Level
11	Durability: biological	2.2.11	Description
12	Impact resistance <ul style="list-style-type: none"> • Soft body impact resistance • Hard body impact resistance 	2.2.12	Level
Basic Works Requirement 5: Protection against noise			
13	Airborne sound insulation (surface mass)	2.2.13	Level
14	Acoustic absorption	2.2.14	Level
Basic Works Requirement 6: Energy economy and heat retention			
15	Air permeability	2.2.15	Level
16	Thermal conductivity	2.2.16	Level

2.2 Methods and criteria for assessing the performance of the product in relation to essential characteristics of the product

This chapter is intended to provide instructions for TABs. Therefore, the use of wordings such as “shall be stated in the ETA” or “it has to be given in the ETA” shall be understood only as such instructions for TABs on how results of assessments shall be presented in the ETA. Such wordings do not impose any obligations for the manufacturer and the TAB shall not carry out the assessment of the performance in relation to a given essential characteristic when the manufacturer does not wish to declare this performance in the Declaration of Performance.

When the fibreboard presents a relevant fibre orientation, each essential characteristic which may be reliant on fibre orientation shall be determined parallel and perpendicular to fibre orientation (e.g., reaction to fire, propensity to undergo continuous smouldering, bending strength, tensile strength and durability: moisture resistance).

Each fibreboard with different thickness, facings or coatings, density, etc. shall be assessed separately for all the essential characteristics, unless said otherwise for any specific essential characteristic in the applicable clauses.

2.2.1 Reaction to fire

Purpose of the assessment

The purpose of the assessment is to provide the reaction to fire of fibreboards.

Assessment method

The fibreboards shall be tested using the method(s) relevant for the corresponding reaction to fire class according to EN 13501-1. The product shall be classified according to the Commission Delegated Regulation (EU) No 2016/364.

The single burning item test (EN 13823) and the small ignition source test (EN ISO 11925-2) shall be performed using the mounting and fixing provisions given in Annex A.

Expression of results

The determined class shall be stated in the ETA. When the fibreboard presents a relevant fibre orientation, it shall be stated in the ETA for which installation configuration the determined class applies (e.g., fibreboard's fibres oriented vertically, horizontally, both, etc.).

2.2.2 Propensity to undergo continuous smouldering

Purpose of the assessment

The purpose of the assessment is to provide the propensity to undergo continuous smouldering of fibreboards.

Assessment method

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 in Annex B.

Expression of results

In accordance with EN 16733, clause 11, the ETA shall specify the following information, depending on the outcome 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”.

When the fibreboard presents a relevant fibre orientation, it shall be stated in the ETA for which installation configuration the performance applies (e.g., fibreboard's fibres oriented vertically, horizontally, both, etc.).

2.2.3 Content, emission and/or release of dangerous substances

The performance of the product related to the emissions and/or release and, where appropriate, the content of dangerous substances will be assessed on the basis of the information provided by the manufacturer³ after identifying the release scenarios taking into account the intended use of the product and the Member States where the manufacturer intends his product to be made available on the market.

The identified intended release scenarios for this product and intended use with respect to dangerous substances are:

IA1: Product with direct contact to indoor air.

IA2: Product with indirect contact to indoor air (e.g., covered products) but possible impact on indoor air.

2.2.3.1 SVOC and VOC

Purpose of the assessment

The purpose of the assessment is to provide the SVOC and VOC of fibreboards.

Assessment method

For the intended uses covered by the release scenarios IA1 and IA2, semi-volatile organic compounds (SVOC) and volatile organic compounds (VOC) shall be determined in accordance with EN 16516. The loading factor [m^2/m^3] used for emission testing shall be taken from Table 2.2.3.1.1.

Table 2.2.3.1.1 Loading factor L, depending on the product type (in accordance with EN 16516).

Intended use	Loading factor [m^2/m^3]
Walls	1,0
Floor, ceiling	0,4

The preparation of the test specimen shall be performed by using a representative sample of the product installed in accordance with the manufacturer's product installation instructions or, in absence of such instructions, the usual practice of the product installation.

Once the test specimen has been produced, as described above, it shall immediately be placed in the emission test chamber. This time shall be considered the starting time of the emission test.

The test results shall be reported for the relevant parameters (e.g., chamber size, temperature and relative humidity, air exchange rate, loading factor, size of test specimen, conditioning, production date, arrival date, test period, test result) after 3 and 28 days testing.

³ The manufacturer may be asked to provide to the TAB the REACH related information which shall accompany the DoP with (cf. Article 6(5) of Regulation (EU) No 305/2011).

The manufacturer may not be obliged by the EAD or the TAB to:

- provide the chemical constitution and composition of the product (or of constituents of the product) to the TAB, or
- provide a written declaration to the TAB stating whether the product (or constituents of the product) contain(s) substances which are classified as dangerous according to Directive 67/548/EEC and Regulation (EC) No 1272/2008 and listed in the "Indicative list on dangerous substances" of the SGDS, taking into account the installation conditions of the construction product and the release scenarios resulting from there.

Any information provided by the manufacturer regarding the chemical composition of the products may not be distributed to EOTA, to other TABs or beyond.

Expression of results

The product performance shall be expressed in $\mu\text{g}/\text{m}^3$ and stated in the ETA.

2.2.3.2 Release of formaldehyde

Purpose of the assessment

The purpose of the assessment is to provide the release of formaldehyde of fibreboards.

Assessment method

Release of formaldehyde shall be determined in accordance with EN 717-1.

Expression of results

Release of formaldehyde [in mg/m^3 air] and test chamber option (EN 717-1, clause A.1, A.2 or A.3) shall be stated in the ETA.

2.2.4 Water vapour permeability

Purpose of the assessment

The purpose of the assessment is to provide the water vapour permeability of fibreboards.

Assessment method

Water vapour permeability shall be determined by testing in accordance with EN ISO 12572. Test conditions A of table 1 of EN ISO 12572 and test arrangements of annex A of EN ISO 12572 shall be used.

Expression of results

The mean value of water vapour transmission coefficient in accordance with Clause 8.6 of EN ISO 12572 shall be stated in the ETA.

2.2.5 Bending strength and modulus of elasticity in bending

Purpose of the assessment

The purpose of the assessment is to provide the bending strength and modulus of elasticity in bending of fibreboards.

Assessment method

Bending strength and modulus of elasticity in bending shall be determined by testing in accordance with EN 310. The characteristic value 5% of the bending strength shall be determined in accordance with EN 326-1 equation 7.3.6.

Expression of results

The characteristic value 5% of the bending strength [in N/mm^2] shall be stated in the ETA. For the modulus of elasticity, the mean value [in N/mm^2] shall be stated in the ETA.

When the fibreboard presents a relevant fibre orientation, it shall be stated in the ETA whether the fibreboard has been assessed parallel or perpendicular to the fibres orientation.

2.2.6 Tensile strength

Purpose of the assessment

The purpose of the assessment is to provide the tensile strength of fibreboards.

Assessment method

Tensile strength shall be determined by testing in accordance with EN 789, clause 9.

At least 18 specimens shall be tested. Specimens shall be cut from 3 fibreboards, 6 specimens for each fibreboard. Within each fibreboard, there shall be 2 sets of 3 specimens each, one set shall be cut following one principal direction of the plane of the fibreboard, the other set shall follow the second principal direction (perpendicular to one another). Each set shall include one specimen from the corner, one from the edge and one from the centre of the fibreboard.

The characteristic value 5% shall be determined in accordance with EN 1058.

Expression of results

The characteristic value 5% of the tensile strength [in N/mm²] shall be stated in the ETA.

When the fibreboard presents a relevant fibre orientation, it shall be stated in the ETA whether the fibreboard has been assessed parallel or perpendicular to the fibres' orientation.

2.2.7 Internal bond

Purpose of the assessment

The purpose of the assessment is to provide the internal bond of fibreboards.

Assessment method

Internal bond shall be determined by testing in accordance with EN 319. The characteristic value 5% shall be determined according to EN 326-1 equation 7.3.6.

Expression of results

The characteristic value 5% of the internal bond [in N/mm²] shall be stated in the ETA.

2.2.8 Dimensional stability

Purpose of the assessment

The purpose of the assessment is to provide the dimensional stability of fibreboards.

Assessment method

Dimensional stability shall be determined by testing in accordance with EN 318.

Specimens shall be in accordance with EN 318, clause 5. Sampling shall be done in accordance with EN 326-1 considering that, when the fibreboard is homogeneous, and therefore, fibre orientation can be neglected, only two sets of four specimens each shall be cut (8 specimens per fibreboard) and tested.

Expression of results

Length and thickness changes [in mm/m] and [in %] respectively shall be stated in the ETA.

2.2.9 Durability: swelling in thickness

Purpose of the assessment

The purpose of the assessment is to provide the swelling in thickness of fibreboards.

Assessment method

Swelling in thickness shall be determined by testing in accordance with EN 317. Immersion time shall be 24 hours. The mean value and the characteristic value 95 % shall be determined in accordance with EN 326-1.

Expression of results

The mean value and the characteristic value 95 % of swelling in thickness [in %] shall be stated in the ETA.

2.2.10 Durability: moisture resistance

Purpose of the assessment

The purpose of the assessment is to provide the moisture resistance of fibreboards.

Assessment method

Moisture resistance shall be determined by testing the bending strength after an ageing in accordance with EN 1087-1 with the modifications stated in EN 622-3, annex C. The bending strength after the ageing shall be tested in accordance with EN 310. The mean value and the characteristic value 5 % shall be determined in accordance with EN 326-1.

Expression of results

The mean value and the characteristic value 5 % of moisture resistance [in N/mm²] shall be stated in the ETA.

When the fibreboard presents a relevant fibre orientation, it shall be stated in the ETA whether the fibreboard has been assessed parallel or perpendicular to the fibres orientation.

2.2.11 Durability: biological

Purpose of the assessment

The purpose of the assessment is to provide the biological durability of fibreboards.

Assessment method

The durability to biological agents of the product shall be determined depending on the intended uses of the product.

For interior uses in which the fibreboard is not exposed to the weather and wetting, corresponding to use class 1 defined in EN 335, the following biological attacks shall be assessed:

- 1) Larvae of dry wood-destroying beetles.
- 2) Termites.

For interior uses in which the fibreboard is under cover and not exposed to the weather but where occasional, but not persistent, wetting may occur, corresponding to use class 2 defined in EN 335, the following biological attacks shall be assessed (additionally to testing for class 1):

- 3) Wood-destroying fungi causing cubic and fibrous rot.
- 4) Wood-destroying fungi causing soft rot.

Tests for 1) shall be done in accordance with EN 350, clause 6.2.

The resistance of the product to attack by *Hylotrupes bajulus*, *Anobium punctatum* and *Lyctus brunneus* shall be tested as stated in EN 350, clause 6.2.

Durability to larvae of dry wood-destroying beetles shall be classified in accordance with table 2 of EN 350, per each attack tested.

Test for 2) shall be done in accordance with EN 350, clause 6.3.

The resistance of the product to attack by termites *Reticulitermes* shall be tested using procedures based on EN 117.

Durability to termites shall be classified in accordance with table 9 of EN 350.

Tests for 3) shall be done in accordance with EN 350, clause 6.1.2.2.

The resistance of the product to attack by *Coniophora puteana* shall be tested using procedures based on ENV 12038.

The resistance of the product to attack by other species of wood-destroying fungi covered for ENV 12038 shall be tested using the same procedures.

Durability to wood-destroying fungi causing cubic and fibrous rot shall be classified in accordance with table 5 of EN 350, per each attack tested.

Tests for 4) shall be done in accordance with ENV 807.

Specimens of the product shall be used in place of the preservative treated wood specimens mentioned in ENV 807.

Durability to wood-destroying fungi causing soft rot shall be classified in accordance with table 6 of EN 350.

Expression of results

For each biological attack assessed, the description related to the durability class in accordance with the applicable assessment method (see tables 2, 5, 6 and 9 of EN 350) shall be stated in the ETA.

2.2.12 Impact resistance

2.2.12.1 Soft body impact resistance

Purpose of the assessment

The purpose of the assessment is to provide the impact resistance of fibreboards.

Assessment method

The impact resistance of the product shall be determined by testing soft and hard body impact resistance.

Tests for determining soft body impact resistance shall be done in accordance with Annex C.

Serviceability and safety in use tests shall be performed.

Expression of results

The values of soft body impact resistance [in J] shall be stated in the ETA.

2.2.12.2 Hard body impact resistance

Purpose of the assessment

The purpose of the assessment is to provide the impact resistance of fibreboards.

Assessment method

The impact resistance of the product shall be determined by testing soft and hard body impact resistance.

Tests for determining hard body impact resistance shall be done in accordance with Annex D.

Serviceability and safety in use tests shall be performed.

Expression of results

The values of hard body impact resistance [in J] shall be stated in the ETA.

2.2.13 Airborne sound insulation (surface mass)

Purpose of the assessment

The purpose of the assessment is to provide the airborne sound insulation (surface mass) of fibreboards.

Assessment method

Airborne sound insulation shall be assessed by calculation of the sound transmission loss in accordance with EN 13986, clause 5.10.

Expression of results

Airborne sound insulation [in dB] shall be stated in the ETA.

2.2.14 Acoustic absorption

Purpose of the assessment

The purpose of the assessment is to provide the acoustic absorption of fibreboards.

Assessment method

Acoustic absorption shall be determined by testing in accordance with EN ISO 354. Installation method A of EN ISO 354 applies.

The measured acoustic absorption coefficient shall be expressed as the weighted sound absorption coefficient (α_w) in accordance with EN ISO 11654.

Expression of results

Acoustic absorption coefficient shall be stated in the ETA.

2.2.15 Air permeability

Purpose of the assessment

The purpose of the assessment is to provide the air permeability of fibreboards.

Assessment method

Air permeability shall be determined by testing in accordance with EN 12114. At least one pressure difference shall be tested. Pressure differences shall be chosen from values stated in EN 12114 Annex A.

Expression of results

Air flow [in m³/h] per each maximum pressure difference tested shall be stated in the ETA.

2.2.16 Thermal conductivity

Purpose of the assessment

The purpose of the assessment is to provide the thermal conductivity of fibreboards.

Assessment method

Thermal conductivity shall be determined by testing in accordance with guarded hot plate method described in EN 12664. Specimens shall comply with EN 12664 clause 6.2 and Annex A and be conditioned in accordance with EN 12664 clause 7.2.2.

Expression of results

Thermal conductivity [in $W/(m \cdot K)$] shall be stated in the ETA.

3 ASSESSMENT AND VERIFICATION OF CONSTANCY OF PERFORMANCE

3.1 System(s) of assessment and verification of constancy of performance to be applied

For the products covered by this EAD the applicable European legal act is Commission Decision 97/462/EC, as amended by Commission Decision 2001/596/EC.

The applicable AVCP system is 4 for any use except for uses subjected to regulations on reaction to fire.

For uses subject to regulations on reaction to fire⁴ the applicable AVCP systems regarding reaction to fire are 1, 3 or 4 depending on the conditions defined in the said Decision.

⁴ Including propensity to undergo continuous smouldering, where relevant.

3.2 Tasks of the manufacturer

The cornerstones of the actions to be undertaken by the manufacturer of the product in the procedure of assessment and verification of constancy of performance are laid down in Table 3.2.1.

Table 3.2.1 Control plan for the manufacturer; cornerstones.

No	Subject/type of control	Test or control method	Criteria, if any	Minimum number of samples	Minimum frequency of control
Factory production control (FPC) [including testing of samples taken at the factory in accordance with a prescribed test plan]					
1	Type and quality of raw materials	According to Control Plan	According to Control Plan	All	Every delivery
2	Absence of pentachlorophenol (PCP) in industrial cellulosic residues (raw material)	Checking of supplier certificates or supplier test according to EN ISO 15320	No PCP	All	Every delivery
3	Enzymatic process control	According to Control Plan	According to Control Plan	-	Every batch
4	Thickness	EN 325	According to Control Plan	1	Every day
5	Density	EN 323	According to Control Plan	1	Every day
6	Reaction to fire	Check that all relevant indirect parameters as determined within the reaction to fire tests are fulfilled (e.g.,: <ul style="list-style-type: none"> • thickness, • density and • type of coverage) 	According to Control Plan	1	Every day
7	Propensity to undergo continuous smouldering	Check that all relevant indirect parameters as determined within the reaction to fire tests are fulfilled (e.g.,: <ul style="list-style-type: none"> • thickness and • density) 	According to Control Plan	1	Every day
8	Bending strength	EN 310	According to Control Plan	1	Every batch or at least every week
9	Internal bond	EN 319	According to Control Plan	1	
10	Durability: swelling in thickness	EN 317	According to Control Plan	1	
11	Water vapour permeability	See note 1	According to Control Plan	1	Every batch or at least every week
12	Tensile strength	See note 1	According to Control Plan	1	
13	Dimensional stability	See note 1	According to Control Plan	1	

No	Subject/type of control	Test or control method	Criteria, if any	Minimum number of samples	Minimum frequency of control
14	Impact resistance	See note 1	According to Control Plan	1	
15	Airborne sound insulation (surface mass)	See note 1	According to Control Plan	1	
16	Acoustic absorption	See note 1	According to Control Plan	1	
17	Air permeability	See note 1	According to Control Plan	1	
18	Thermal conductivity	See note 1	According to Control Plan	1	
19	Durability: moisture resistance	See note 2	According to Control Plan	1	
20	Content, emission and/or release of dangerous substances	See note 3	According to Control Plan	1	
21	Release of formaldehyde	See note 3	According to Control Plan	1	
22	Durability: biological	See note 3	According to Control Plan	1	
<p>Note 1: These characteristics are controlled by indirect testing of the fibreboard's density and thickness.</p> <p>Note 2: These characteristics are controlled by indirect testing of the fibreboard's density, thickness and bending strength.</p> <p>Note 3: These characteristics are controlled by indirect testing of the fibreboard's density, thickness and type and quality of raw materials.</p>					

3.3 Tasks of the notified body

The intervention of the notified body under AVCP system 1 is only necessary for reaction to fire⁵ for products for which a clearly identifiable stage in the production process results in an improvement of the reaction to fire classification (e.g., an addition of fire-retardants or a limiting of organic material).

In this case the cornerstones of the tasks to be undertaken by the notified body under AVCP system 1 are laid down in Table 3.3.1.

Table 3.3.1 Control plan for the notified body; cornerstones.

No	Subject/type of control	Test or control method	Criteria, if any	Minimum number of samples	Minimum frequency of control
Initial inspection of the manufacturing plant and of factory production control carried out by the manufacturer regarding the constancy of performance related to reaction to fire					
1	Where the intervention of the Notified Body is necessary only because the conditions for the applicability of system 1 are fulfilled for reaction to fire and propensity to undergo continuous smouldering, the notified body will consider especially the clearly identifiable stage in the production process which results in an improvement of the reaction to fire classification (e.g., an addition of fire retardants or a limitation of organic material).	Verification of the complete FPC as described in the control plan agreed between the TAB and the manufacturer	As defined in the control plan agreed between the TAB and the manufacturer	As defined in the control plan agreed between the TAB and the manufacturer	When starting the production or after its modification
Continuous surveillance, assessment and evaluation of factory production control carried out by the manufacturer regarding the constancy of performance related to reaction to fire					
2	Where the intervention of the Notified Body is necessary only because the conditions for the applicability of system 1 in the Decisions regarding reaction to fire and propensity to undergo continuous smouldering are fulfilled, the notified body will consider especially the clearly identifiable stage in the production process which results in an improvement of the reaction to fire classification (e.g., an addition of fire retardants or a limitation of organic material).	Verification of the controls carried out by the manufacturer as described in the control plan agreed between the TAB and the manufacturer with reference to the raw materials, to the process and to the product as indicated in Table 3.2.1	As defined in the control plan agreed between the TAB and the manufacturer	As defined in the control plan agreed between the TAB and the manufacturer	Once per year

⁵ Including propensity to undergo continuous smouldering, where relevant.

4 REFERENCE DOCUMENTS

EN 117:2023	Wood preservatives. Determination of toxic values against Reticulitermes species (European termites) (Laboratory method).
EN 310:1993	Wood-based panels. Determination of modulus of elasticity in bending and of bending strength.
EN 317:1993	Particleboards and fibreboards. Determination of swelling in thickness after immersion in water.
EN 318:2002	Wood based panels. Determination of dimensional changes associated with changes in relative humidity.
EN 319:1993	Particleboards and fibreboards. Determination of tensile strength perpendicular to the plane of the board.
EN 323:1993	Wood-based panels. Determination of density.
EN 325:2012	Wood-based panels. Determination of dimensions of test pieces.
EN 326-1:1994	Wood-based panels. Sampling, cutting and inspection. Part 1: Sampling and cutting of test pieces and expression of test results.
EN 335:2013	Durability of wood and wood-based products. Use classes: definitions, application to solid wood and wood-based products.
EN 350:2016	Durability of wood and wood-based products. Testing and classification of the durability to biological agents of wood and wood-based materials.
EN 622-3:2004	Fibreboards. Specifications. Part 3: Requirements for medium boards.
EN 717-1:2004	Wood-based panels - Determination of formaldehyde release - Part 1: Formaldehyde emission by the chamber method.
EN 789:2004	Timber structures. Test methods. Determination of mechanical properties of wood based panels.
EN 1058:2009	Wood-based panels - Determination of characteristic 5-percentile values and characteristic mean values.
EN 1087-1:1995	Particleboards. Determination of moisture resistance. Part 1: Boil test.
EN 12114:2000	Thermal performance of buildings. Air permeability of building components and building elements. Laboratory test method.
EN 12664:2001	Thermal performance of building materials and products. Determination of thermal resistance by means of guarded hot plate and heat flow meter methods. Dry and moist products of medium and low thermal resistance.
EN 13238:2010	Reaction to fire tests for building products - Conditioning procedures and general rules for selection of substrates.
EN 13501-1:2018	Fire classification of construction products and building elements. Part 1: Classification using data from reaction to fire tests.
EN 13823:2012+A1:2014	Reaction to fire tests for building products - Building products excluding floorings exposed to the thermal attack by a single burning item.
EN 13986:2004+A1:2015	Wood-based panels for use in construction. Characteristics, evaluation of conformity and marking.
EN 16516:2017+A1:2020	Construction products: Assessment of release of dangerous substances – Determination of emissions into indoor air.
EN 16733:2016	Reaction to fire tests for building products. Determination of a building product's propensity to undergo continuous smouldering.
ENV 807:2001	Wood preservatives – Determination of the effectiveness against soft rotting micro-fungi and other soil inhabiting micro-organisms.
ENV 12038:2002	Durability of wood and wood-based products. Wood-based panels. Method of test for determining the resistance against wood-destroying basidiomycetes.
EN ISO 354:2003	Acoustics. Measurement of sound absorption in a reverberation room. (ISO 354:2003).
EN ISO 11654:1997	Acoustics. Sound absorbers for use in buildings. Rating of sound absorption. (ISO 11654:1997)
EN ISO 11925-2:2020	Reaction to fire tests - Ignitability of products subjected to direct impingement of flame - Part 2: Single-flame source test (ISO 11925-2:2020)
EN ISO 12572:2016	Hygrothermal performance of building materials and products. Determination of water vapour transmission properties. Cup method (ISO 12572:2016).
EN ISO 15320:2011	Pulp, paper and board - Determination of pentachlorophenol in an aqueous extract (ISO 15320:2011).

ANNEX A – MOUNTING AND FIXING PROVISIONS AS WELL AS EXTENDED APPLICATIONS RULES FOR THE RELEVANT REACTION TO FIRE TESTS

A.1 Single burning item test (EN 13823)

A.1.1 Dimensions of the test rig

The test rig consists of a corner with a short and a long wing. The dimensions of the specimens shall be:

Assembly dimensions (mm – nominally)		
	Length	Height
Short wing	500	1.500
Long wing	1.000 + t	1.500

Where t = thickness of the fibreboards

On the long wing of the test specimen at least one vertical and one horizontal joint shall be considered as prescribed in the test standard (200 mm away from the inner corner of the test specimen and 500 mm above the floor of the specimen trolley).

A.1.2 Test specimen

The fibreboards used in the test assembly shall always include all facings and/or coatings that are applied to the product, as it is placed onto the market. Each facing and/or coating type requires new tests.

Influences of different colours of facings or coatings may be determined by performing indicative SBI tests on a light colour, a dark colour and red. The complete SBI test shall be conducted at least on the worst case. If the colour leads to different class or sub-class (smoke and droplets) the worst case for each class or sub-class shall be tested to obtain each class or sub-class.

The assembly, including the joint detail and corner detail, shall be in accordance with end use conditions, as specified by the ETA-applicant.

A.1.3 Mounting and fixing of the test assembly

Fibreboards shall be mounted and fixed according to EN 13823 and as specified below.

Assemblies with framework/studs

The fibreboards shall be fixed on a framework, using the fixing system and, if relevant, the jointing material, profile, etc., as specified by the manufacturer, representing the joint achieved in end use.

The fibreboards are mounted on a wooden or metallic frame. The wooden frame is made of wood strips (40 ± 1) mm x (40 ± 1) mm for vertical members and (20 ± 1) mm x (40 ± 1) mm for horizontal members nailed or screwed together. Metal framework shall be in accordance to the manufacturer's specifications. Test results for timber framework also apply for metal framework.

In accordance with EN 13823, the minimum distance between the backing boards and the fibreboards samples shall be 40 mm. For final uses where ventilation behind the fibreboards is relevant, the frame between backing board and specimen shall be open at the sides to allow ventilation into the gap (e.g., using spacer bars at top and bottom).

If the fibreboards is intended to be used with filling material behind, the gap between backing board and specimen shall be filled with filling material meeting the manufacturer's specifications.

The fastening pattern and number of mechanical fasteners shall correspond to the manufacturer's specifications. They shall be reported in the test report.

Assemblies without framework (substrate)

The fibreboards shall be fixed or adhered onto the substrate without the use of studs or frameworks, according to their end use.

For fibreboards intended to be adhered to substrates, they shall be adhered with the adhesive in accordance with the manufacturer's specifications. The quantity and pattern of adhesive shall correspond to the manufacturer's specifications. One or more of the substrates defined in EN 13238 shall be used, with the applications of test results stated in EN 13238. Other substrate (deviating from EN 13238) may also be used for testing purposes. However, in this case the test results will only be valid for the practical use of the fibreboards on this specific substrate.

For fibreboards intended to be fixed onto substrates, the fastening pattern and number of mechanical fasteners shall correspond to the manufacturer's specifications. They shall be reported in the test report.

The fibreboards intended to be fixed to substrates with an air gap shall be tested accordingly. The minimum distance of air gap is 40 mm (e.g., using spacer bars at top and bottom). Test results with an air gap also apply for the same substrate without the gap.

A.1.4 Extended applications of test results

The results of tests considering the parameters of the specimen are also valid for fibreboards:

- with the same product composition (type of fibres, facings or coatings, etc.),
- with less quantity of organic binder,
- with higher density and
- with higher thickness.

A.2 Small ignition source test (EN ISO 11925-2)

A.2.1 Dimensions of the test specimen

The dimensions of the test specimens shall be as prescribed in clause 5.2 of EN ISO 11925-2.

A.2.2 Test specimen

The fibreboards used in the test assembly shall always include all facings and/or coatings that are applied to the product, as it is placed onto the market. Each facing and/or coating type requires new tests.

Influences of different colours of facings or coatings may be determined by testing two specimens for each relevant colour (i.e., light colour, dark colour and red). The complete small ignition source test shall be conducted at least on the worst case.

A.2.3 Mounting and fixing of the test assembly

Fibreboards shall be mounted and fixed according to EN ISO 11925-2. The flame is applied on the surface of the fibreboard, according to clause 7.3.3.1 of EN ISO 11925-2.

A.2.4 Extended applications of test results

The results of tests considering the parameters of the specimen are also valid for fibreboards:

- with the same product composition (type of fibres, facing or coatings, etc.),
- with less quantity of organic binder,
- with higher density and
- with higher thickness.

ANNEX B – PROVISIONS FOR PROPENSITY TO UNDERGO CONTINUOUS SMOULDERING TEST

B.1 Sample taking

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

- product-type (binder, additives, type of fibres etc.)⁶;
- the product or product variant with the highest as well as the lowest density of the wood-based panel, determined by tests according to EN 323;
- the product or product variant with the highest thickness of the wood-based panel, determined by tests according to EN 325 on at least three specimens;
- each different produced shape / fibre orientation, i.e., lengthwise and crosswise to the length direction of the specimen, and
- without any facings, coatings or suchlike – existing facings or coatings shall be removed when preparing the test specimen.

B.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.

B.3 Extended application of test results

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

- of the same product-type (e.g., composition of wood-based panels),
- with all densities of wood-based panels between those evaluated,
- with lower thickness of wood-based 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.

⁶ In order to permit the TAB to apply rules for the extended application of test results within the assessment, it is recommended that the manufacturer should provide (but he is not obliged to do so) 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 should be submitted to testing and so to reduce the number of tests required.

ANNEX C – TEST METHOD FOR DETERMINING SOFT BODY IMPACT RESISTANCE

C.1 Principle

The soft body impact test simulates an impact resulting from a person accidentally falling against the fibreboard.

The soft body is dropped from a height, creating an impact energy, which corresponds with the impact energy released by a person.

The test shall be conducted with reference to safety in use, i.e., verification whether the fibreboard or fibreboard assemblies would prevent a person falling through, and to serviceability, i.e., verification whether they would still perform as intended.

For wall uses, the test shall be performed on a vertical assembly (see Figure C.2). For ceiling and floor uses, the test is performed on a horizontal assembly (see Figure C.3).

C.2 Test apparatus

The soft body impactor shall be a spherical canvas bag of diameter (400 ± 40) mm (see Figure C.1) filled with $(3,0 \pm 0,3)$ mm diameter glass spheres to give a total weight of $(50 \pm 0,5)$ kg.

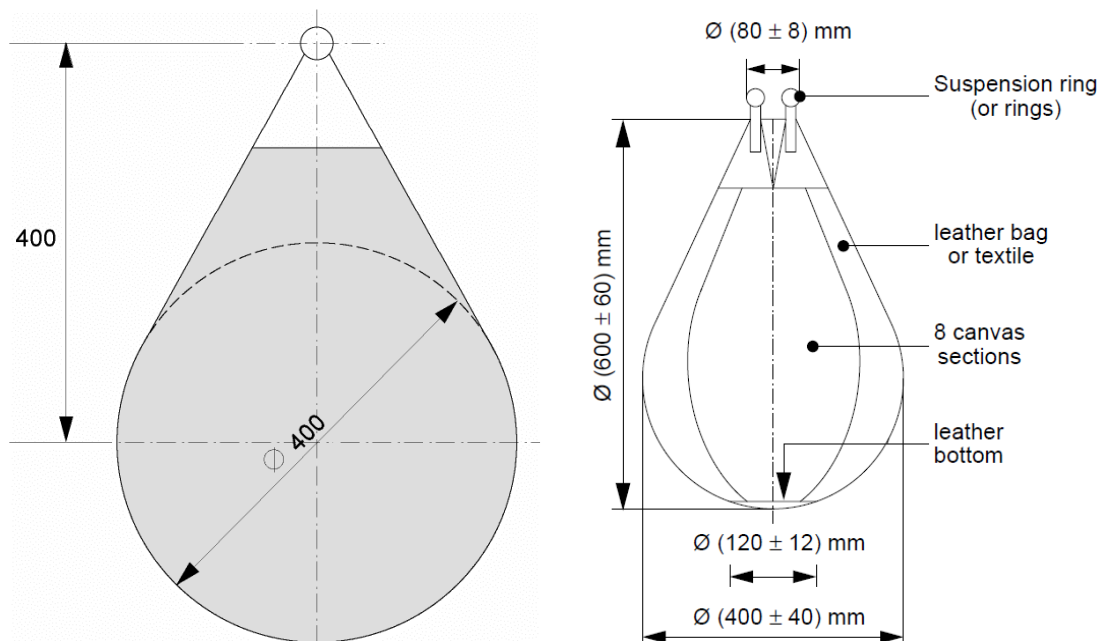


Figure C.1: Soft body impactor. Theoretical size of the bag and 50 kg spheroconical bag.

C.3 Number of tests

C.3.1 Serviceability impact resistance

The test shall be carried out on one test assembly, and generally consists of at least three impacts with the same energy at about the same point of impact. The point of impact shall be the worst case for the assembly under examination.

If various impact energies are being tested, new assemblies shall be tested for each impact energy.

C.3.2 Safety in use impact resistance

The test shall be carried out on one test assembly and consists of one impact.

The point of impact shall be the one deemed as the worst case for the assembly under examination.

If various impact energies are being tested, new assemblies shall be tested for each level of impact energy.

Note - The serviceability and safety in use impact test should not be carried out on the same assembly.

C.4 Conditioning and test conditions

The fibreboard conditioning shall be recorded, where applicable.

The conditioning period, if any, shall be done according to the manufacturer's product installation instructions.

The test shall be carried out in normal laboratory circumstances.

C.5 Test assembly

The fibreboards shall be mounted in accordance with the manufacturer's installation specifications, with regard to the intended use (wall or ceiling panel), so that the test assembly corresponds as much as possible with end use conditions.

The manner in which components are fixed to each other shall reproduce actual conditions of use, particularly with respect to the nature, type and position of the fixings and the distance between them.

If the manufacturer's specifications foresee more than one possible end-use assembly, the TAB shall at least perform the test on the worst case. In principle, the worst case assembly shall be:

- fibreboard: the fibreboard with the highest ratio length (or height) over width in its minimum thickness;
- span: maximum distance between supports.

Other assemblies may also be tested. Test results shall be linked to each tested assembly.

C.6 Test procedure

In this test, the soft body impactor, with mass (m) [in kg] is dropped from a height (h) [in m], so that the total impact energy ($E = m \cdot g \cdot h$, where $g = 9,81 \text{ m/s}^2$) corresponds with one of the following energies E (in J): 60, 100, 120, 130, 200, 240, 300, 400, 500, 600, 700, 900 and 1200.

The height (h) shall be measured between the designated point of impact and the height of release of the soft body impactor.

For tests conducted on wall assemblies the angle α shall always be smaller or equal to 65° (see Figure C.2).

The bag shall be held vertically when released (not horizontally).

Test procedure shall be carried out using one of the following options:

1. When the impact resistance is known, the impact tests at the energy for this known impact resistance shall be performed and when successful (criteria set in clause C.7, either for safety or for serviceability purposes), the increasing impacts shall be applied until highest impact value is achieved.
2. When the impact resistance is not known (reference method), then tests shall start with the lowest impact energy and continue increasing the impacts, with the aim of obtaining the maximum impact resistance.

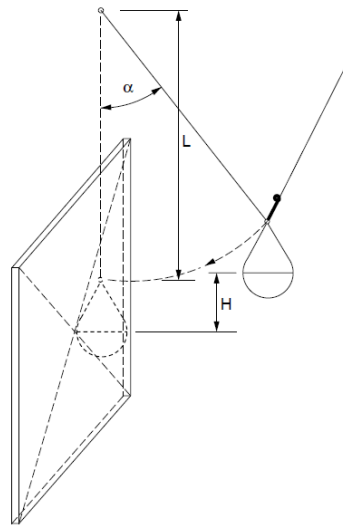


Figure C.2: Impact on vertical assembly. H = drop height; L = length rope; $\alpha = 65^\circ$.

For ceiling and floor assemblies, the test shall be performed on a horizontal assembly (see Figure C.3).

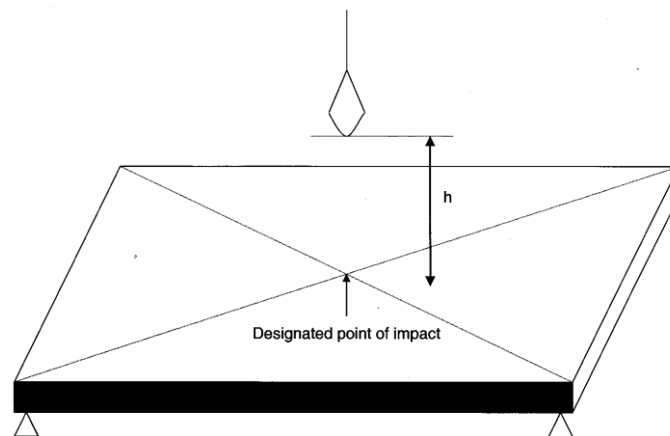


Figure C.3: Vertical impact on horizontal assembly. H = drop height.

C.7 Expression of test results

The following criteria applies to safety in use and serviceability:

For safety in use:

- no collapse: the test result is favourable when, after the test, the fibreboard or assembly maintains its mechanical integrity and is still capable of carrying its own weight in the tested position;
- no penetration: the test result is favourable when, after the test, the impactor has not passed through the test specimen;
- no projection: the test result is favourable when, after the test, the impactor has not created parts of the fibreboard (e.g., core, face, reinforcement) to project from the face of the fibreboard, on the other side of the specimen than the impact side, creating sharp cutting edges or surfaces likely to cause personal injury by contact.

For serviceability:

- no penetration: the test result is favourable when, after the test, the impactor has not penetrated the face of the test specimen on the impact side of the specimen.
- no degradation: the test result is favourable when, after the test, there are no visible (to the naked eye) cracks, depressions, protuberances or any other defects in the materials, which may influence the

fitness for use of the fibreboard or assembly. Deformations, which only affect the appearance, are allowed, but should be mentioned in the test report.

For serviceability, the residual deflection after each impact shall be reported.

The residual deflection shall be reported five minutes after the impact (in mm).

In a favourable test result, the report shall indicate any damage (e.g., localized surface cavities of small dimensions, scratches, wear marks in the form of grooves, etc.).

For extended application of the test results, the general rule is that test results for the worst case assembly can be used to reflect the behaviour of others.

C.8 Test report

At least the following values and information should be included in the test report:

- reference to Annex C of this EAD;
- the name of the testing laboratory;
- the name of the ETA applicant (and manufacturer of the fibreboard);
- date of the test;
- description of the test instruments;
- identification of the product tested (designation, dimensions and any relevant identification characteristic);
- surface structure (e.g., smooth, profiled, structured...);
- description of the sample tested, and reference to its marking;
- description of conditioning and preparation of the sample (if any);
- description of test conditions (temperature and RH), where applicable;
- results of the test, including a description of damage (if any).

ANNEX D – TEST METHOD FOR DETERMINING HARD BODY IMPACT RESISTANCE

D.1 Principle

The hard body impact test simulates the impact, resulting from an object accidentally falling against the fibreboard.

The hard body shall be dropped from a height, creating an impact energy, which corresponds with the impact energy released when furniture or similar objects hit the fibreboard.

The test shall be conducted with reference to safety in use, i.e., verification whether the fibreboard or fibreboard assemblies would prevent an object falling through, and to serviceability, i.e., verification whether they would still perform as intended (e.g., with reference to water vapour tightness).

D.2 Test apparatus

For safety in use, the hard body impactor shall be a steel ball, with a diameter of $(63,5 \pm 1,0)$ mm, with a mass of (1.030 ± 40) g (1 kg steel ball).

For serviceability, it shall be a steel ball, with a diameter of $(50 \pm 0,5)$ mm, with a mass of (514 ± 19) g (0,5 kg steel ball).

D.3 Number of tests

D.3.1 Serviceability impact resistance

The test shall be carried out on one test fibreboard, and generally consists of at least three impacts at approximately the same point of impact.

The point of impact shall be the one deemed as the worst case for the assembly under examination.

D.3.2 Safety in use impact resistance

The test shall be carried out on one test fibreboard, and consists of one impact.

The point of impact shall be the one deemed as the worst case for the assembly under examination.

Note - The serviceability and safety in use impact test should not be carried out on the same fibreboard.

D.4 Conditioning and test conditions

The fibreboard conditioning shall be recorded, where applicable. The conditioning period, if any, shall be done according to the manufacturer's product installation instructions.

The test shall be carried out in normal laboratory circumstances.

D.5 Test assembly

The fibreboard shall be horizontally positioned on supports (see Figure D.1), to allow, in case of an unfavourable test result, the possibility of the impactor going completely through the fibreboard.

The worst point of impact shall be chosen.

In most cases this will be the centre of the fibreboard, but, for fibreboards with reinforcement (studs, stiffening ribs, etc.) behind a relatively weak face, the worst impact position is (25 ± 2) mm from the edge of the reinforcement.

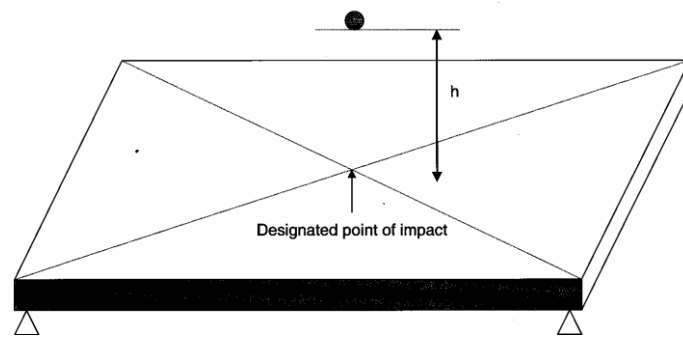


Figure D.1: Assembly for hard body impact test.

D.6 Test procedure

In this test, the hard body impactor with mass (m) [in kg] is dropped from a height (h) [in m], so that the total impact energy ($E = m \cdot g \cdot h$, where $g = 9,81 \text{ m/s}^2$) corresponds with one of:

- hard body impact test (1 kg steel ball): 3 J or 10 J;
- hard body impact test (0,5 kg steel ball): 1,3 J; 2,5 J; 3,75 J or 6 J.

The height (h) shall be measured between the designated point of impact and the height of release of the hard body impactor.

Test procedure shall be carried out using one of the following options:

1. When the impact resistance is known, the impact tests at the energy for this known impact resistance shall be performed and when successful (criteria set in clause D.7, either for safety or for serviceability purposes), the increasing impacts shall be applied until highest impact value is achieved.
2. When the impact resistance is not known (reference method), then tests shall start with the lowest impact energy and continue increasing the impacts, with the aim of obtaining the maximum impact resistance.

D.7 Expression of test results

The following criteria applies to safety in use and serviceability:

Safety in use:

- no collapse: the test result is favourable when, after the test, the fibreboard or assembly maintains its mechanical integrity and is still capable of carrying its own weight in the tested position;
- no penetration: the test result is favourable when, after the test, the impactor has not passed the test specimen;
- no projection: the test result is favourable when, after the test, the impactor has not created parts of the fibreboard (e.g., core, face, reinforcement) to project from the face of the fibreboard, on the other side of the specimen than the impact side, creating sharp cutting edges or surfaces likely to cause injury by contact.

Serviceability:

- no penetration: the test result is favourable when, after the test, the impactor has not penetrated the face of the test specimen on the impact side of the specimen;
- no degradation: the test result is favourable when, after the test, there are no visible (to the naked eye) cracks, depressions, protuberances or any other defects in the materials, which may influence the fitness for use of the fibreboard or assembly. Deformations, which only affect the appearance, are allowed, but should be mentioned in the test report.

For serviceability, the diameter and maximum indentation after each impact and the residual diameter and indentation shall be reported (in mm).

In a favourable test result, the report shall indicate any damage (e.g., localized surface cavities of small dimensions, scratches, wear marks in the form of grooves, etc.).

For extended application of the test results, the general rule is that test results for the worst case assembly can be used to reflect the behaviour of others.

D.8 Test report

At least the following values and information should be included in the test report:

- reference to the Annex D of this EAD;
- the name of the testing laboratory;
- the name of the ETA Applicant (and manufacturer of the fibreboard);
- date of the test;
- description of the test instruments;
- identification of the product tested (designation, dimensions and any relevant identification characteristic);
- surface structure (e.g., smooth, profiled, structured...);
- description of the sample tested, and reference to its marking;
- description of conditioning and preparation of the sample (if any);
- description of test conditions (temperature and RH), where applicable;
- results of the test, including a description of damage (if any).