

## EUROPEAN ASSESSMENT DOCUMENT

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# SOUNDPROOFING BOARDS/DRY SCREED AND LOAD BEARING STRIPS MADE OF CORRUGATED CARDBOARD FILLED WITH QUARTZ SAND

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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 the assessment of Soundproofing boards/dry screed and load bearing strips made of corrugated cardboard filled with quartz sand in the following applications:

- Board/dry screed: Board/dry screed made of corrugated cardboard filled with quartz sand for use as non-load bearing acoustic insulation.
- Load bearing strip: strip made of at least at one side PE laminated corrugated cardboard filled with quartz sand for use as load bearing acoustic insulation component.

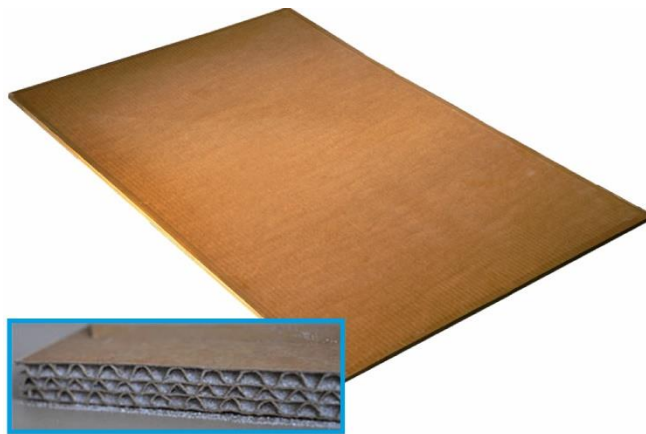


Figure 1: Soundproofing board/dry screed made of corrugated cardboard filled with quartz sand

The product is not covered by a harmonised European standard (hEN).

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 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.

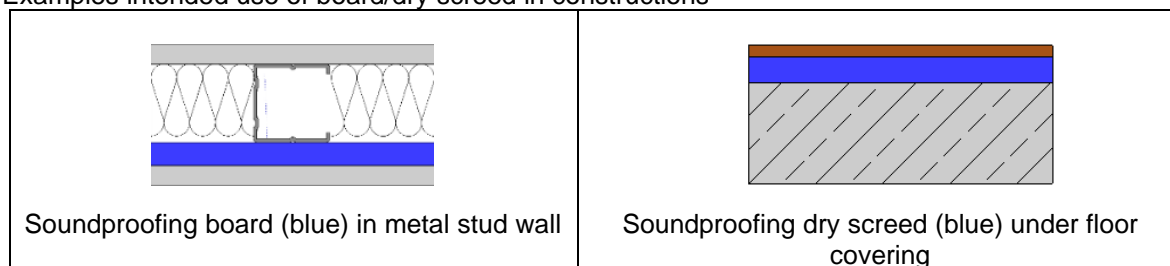
### 1.2 Information on the intended use(s) of the construction product

#### 1.2.1 Intended uses

This EAD covers the following intended uses:

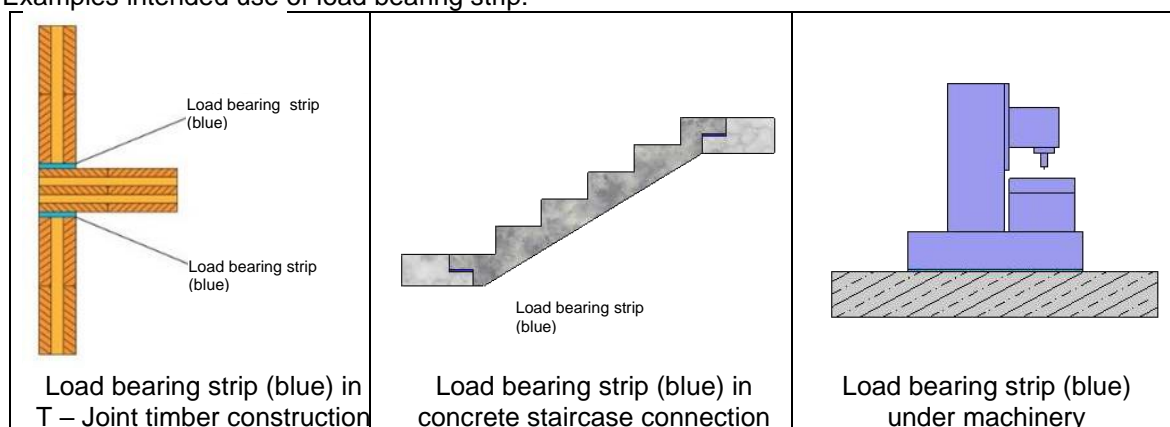
- Board/dry screed as non-load bearing acoustic insulation (see table 1):  
Acoustic insulation component in internal floors, walls, ceilings and roofs. The board/dry screed is only to be used as additional panel(s) behind the surface panel of internal floors, walls, ceilings and roofs in order to improve acoustic and thermal performance. The board/dry screed cannot be the final layer, but can be used as a dry screed. On top of floors, an end surface, underfloor heating elements or screed is needed. On walls, ceilings and roofs it is necessary to screw and/or glue any kind of plaster board or timber blanking on top of the board/dry screed.

## Examples intended use of board/dry screed in constructions



- Load bearing strip as decoupling acoustic insulation component (see Table 2):  
Load bearing acoustic insulation component in floors, walls, ceilings, stairs and under machines. The load bearing strip decouple building components and machines and thereby increase the sound insulation. During installation the load bearing strip shall kept in place with glue or nails/screws of at least 2x thickness of the load bearing strip or clamps.

## Examples intended use of load bearing strip:



## Environmental conditions:

- Dry conditions only.
- A mean daily air temperature in the range from 5 °C to 35 °C with a minimum of 0 °C and a maximum of 50 °C.
- A mean daily air relative humidity in the range from 10 %RH to 75 %RH. Maximum air relative humidity only exceeding 85 %RH for short periods of time.

**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:

- 25 years for the Board/dry screed for the intended use when installed in the works;
- 50 years for the Load bearing strip for the intended use 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 works<sup>1</sup>.

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.

<sup>1</sup> 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.

### **1.3 Specific terms used in this EAD**

#### **1.3.1 Board/dry screed**

Board/dry screed is a rigid product of defined shape and cross section in which the thickness is uniform and substantially smaller than the other dimensions.

*Note: Board/dry screed may not be used as raw material to manufacture load bearing strip since board/dry screed lack use of PE lamination and PP tape.*

#### **1.3.2 Load bearing strip**

Load bearing strip is a rigid product of defined shape and cross section, similar to board/dry screed. However, different from board/dry screed, PP tape is used and load bearing strip is at least at one side PE laminated to improve working life.

## 2 Essential characteristics and relevant assessment methods and criteria

All undated references to standards or to EAD's in this document are to be understood as references to the dated versions listed in chapter 4.

### 2.1 Essential characteristics of the product

Table 1 and Table 2 show how the performance of Soundproofing boards/dry screed and load bearing strips made of corrugated cardboard filled with quartz sand is assessed in relation to the essential characteristics.

**Table 1 Essential characteristics of board/dry screed 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	2.2.1.1	Class
2	Propensity to undergo continuous smouldering	2.2.1.2	Description
Basic Works Requirement 3: Hygiene, health and the environment			
3	Water vapour permeability	2.2.1.3	Level
Basic Works Requirement 4: Safety and accessibility in use			
4	Creep (use in ceilings only)	2.2.1.4	Level
Basic Works Requirement 5: Protection against noise			
5	Airborne sound insulation	2.2.1.5	Level
6	Impact sound insulation	2.2.1.6	Level
7	Dimensions	2.2.1.7	Level
8	Squareness	2.2.1.8	Level
9	Density	2.2.1.9	Level
10	Flexural strength	2.2.1.10	Level
11	Compressive stress / strength	2.2.1.11	Level
12	Surface hardness	2.2.1.12	Level
13	Resistance to functional failure from concentrated load	2.2.1.13	Level
Basic Works Requirement 6: Energy economy and heat retention			
14	Thermal conductivity	2.2.1.14	Level
15	Thermal transmittance	2.2.1.15	Level

**Table 2 Essential characteristics of load bearing strip 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			
16	Reaction to fire	2.2.2.1	Class
17	Propensity to undergo continuous smouldering	2.2.2.2	Description
Basic Works Requirement 3: Hygiene, health and the environment			
18	Water vapour permeability	2.2.2.3	Level
Basic Works Requirement 4: Safety and accessibility in use			
19	Pressure resistance	2.2.2.4	Level
20	Deformation	2.2.2.5	Level
Basic Works Requirement 5: Protection against noise			
21	Vibration reduction index	2.2.2.6	Level
22	Dimensions	2.2.2.7	Level
23	Density	2.2.2.8	Level
Basic Works Requirement 6: Energy economy and heat retention			
24	Thermal conductivity	2.2.2.9	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.

### 2.2.1 Methods and criteria for assessing the performance of Board/dry screed

#### 2.2.1.1 Reaction to fire

The board/dry screed shall be tested according to the method(s) referred to in EN 13501-1 and relevant for the corresponding reaction to fire class.

Concerning the mounting and fixing conditions the provisions of Annex A have to be considered.

The product shall be classified according to Commission Delegated Regulation (EU) no 2016/364. The classification shall be stated in the ETA.

#### 2.2.1.2 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 in Annex A.



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".

### **2.2.1.3 Water vapour permeability**

The water vapour permeability shall be determined in accordance with EN ISO 12572, wet cup method (test condition C, table 1) and stated in the ETA.

### **2.2.1.4 Creep (use in ceilings only)**

Creep shall be tested in accordance with Annex B. The creep coefficient shall be given in the ETA.

### **2.2.1.5 Airborne sound insulation**

The airborne sound insulation shall be determined in accordance with EN ISO 10140-2. The size of the construction is determined by the full-size test opening of the facility.

The measured airborne sound insulation is expressed as a single number rating  $R_w$ , in accordance with EN ISO 717-1. Values apply to the tested construction only.

The tested construction and value shall be given in the ETA.

### **2.2.1.6 Impact sound insulation**

The impact sound insulation of the floor in which the board/dry screed is used and / or the impact sound reduction  $\Delta L$  of the board/dry screed on a heavyweight standard floor is determined according to EN ISO 10140-1,

EN ISO 10140-3, EN ISO 10140-4 and EN ISO 10140-5 as appropriate. Category II according to EN ISO 10140-1, Annex H shall be used.

Using this data the weighted normalized impact sound pressure level  $L_{n,w}$  and / or the weighted impact sound reduction  $\Delta L_w$  is calculated according to EN ISO 717-2. Values apply to the tested construction only.

The weighted normalized impact sound pressure level  $L_{n,w}$  and / or the weighted impact sound reduction  $\Delta L_w$  is given in the ETA together with a description of the assessed floor construction which the given impact sound pressure level / impact sound reduction applies.

### **2.2.1.7 Dimensions**

The length (l) and width (b) shall be determined in accordance with EN 822. The thickness ( $d_b$ ) shall be determined in accordance with EN 12431.

At least 3 random selected samples shall be measured to determine the arithmetic averages. The nominal dimensions and associated tolerances shall be given in the ETA.

### **2.2.1.8 Squareness**

The squareness ( $s_b$ ) shall be determined in accordance with EN 824.

At least 3 random selected samples shall be measured to determine the arithmetic averages. The tolerance shall be given in the ETA.

### **2.2.1.9 Density**

The apparent density ( $\rho_a$ ) shall be determined in accordance with EN 1602.

At least 3 random selected samples shall be measured to determine the arithmetic averages. The arithmetic average, minimum and maximum values shall be given in the ETA.

### **2.2.1.10 Flexural strength**

The flexural strength shall be determined in accordance with EN 520.

At least 3 random selected samples shall be tested to determine the flexural strength. Of each sample the longitudinal and transverse direction shall be tested. The minimum flexural strength, minimum and maximum values in both directions shall be given in the ETA.

**2.2.1.11 Compressive stress / strength**

The compressive stress / strength shall be determined in accordance with EN 826.

At least 3 random selected samples shall be tested to determine the arithmetic average of the compressive strength ( $\sigma_m$ ) / compressive stress at 10% strain ( $\sigma_{10}$ ). The arithmetic averages, minimum and maximum values shall be given in the ETA.

**2.2.1.12 Surface hardness**

The surface hardness shall be determined in accordance with EN 520.

At least 3 random selected samples shall be tested to determine the arithmetic average of the surface hardness. The arithmetic average and maximum value shall be given in the ETA.

**2.2.1.13 Resistance to functional failure from concentrated load**

The resistance to functional failure from concentrated load shall be determined and expressed in accordance with Annex C. Different places of the floor area have to be tested.

The board/dry screed shall be tested without a top layer in case of an intended use with only a soft floor covering (e.g. carpet or linoleum).

The board/dry screed shall be tested with an additional hard layer or hard floor covering in case:

- an additional hard layer is required to meet the requirement to resistance to functional failure from concentrated load (e.g. gypsum fibre board).
- of an intended use with only a hard floor covering (e.g. laminate).

Test results of the board/dry screed without a top layer also apply to board/dry screed with an additional hard layer or hard floor covering.

The tested construction, average deformation and minimum functional failure loads are stated in the ETA.

**2.2.1.14 Thermal conductivity**

The thermal conductivity ( $\lambda$ ) shall be determined in accordance with EN 12664 and shall be given in the ETA.

**2.2.1.15 Thermal transmittance**

The thermal transmittance (U-value) shall be determined in accordance with the simplified calculation method of EN ISO 6946. The assessed construction and value shall be given in the ETA.

**2.2.2 Methods and criteria for assessing the performance of the load bearing strip****2.2.2.1 Reaction to fire**

The load bearing strip shall be tested according to the method(s) referred to in clause 2.2.1.1 of this EAD. The classification shall be stated in the ETA.

**2.2.2.2 Propensity to undergo continuous smouldering**

The performance of the product's propensity to undergo continuous smouldering shall be tested, assessed and specified in accordance with clause 2.2.1.2 of this EAD.

**2.2.2.3 Water vapour permeability**

The water vapour permeability shall be determined in accordance with clause 2.2.1.3 of this EAD and stated in the ETA.

**2.2.2.4 Pressure resistance**

The pressure resistance shall be determined in accordance with EN 26891. The characteristic and design values of the compressive strength and the strength modification factor shall be stated in the ETA.

**2.2.2.5 Deformation**

The deformation shall be tested in accordance with EN 26891. The maximum deformation in mm shall be stated in the ETA.

**2.2.2.6 Vibration reduction index**

The vibration reduction index ( $K_{ij}$ ) shall be determined in accordance with EN ISO 10848-1. The tested construction and value shall be given in the ETA.

**2.2.2.7 Dimensions**

The dimension shall be determined in accordance with clause 2.2.1.7 of this EAD. The nominal dimensions and associated tolerances shall be given in the ETA.

**2.2.2.8 Density**

The apparent density ( $\rho_a$ ) shall be determined in accordance with clause 2.2.1.9 of this EAD.

The apparent density ( $\rho_a$ ) shall be given in the ETA.

**2.2.2.9 Thermal conductivity**

The thermal conductivity ( $\lambda$ ) shall be determined in accordance with clause 2.2.1.14 and shall be given 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: Decision 2000/273/EC as amended by Commission Decision 2001/596/EC.

The applicable AVCP system is 3 for any use except for uses subject to regulations on reaction to fire.

For uses subject to regulations on reaction to fire (including the propensity to undergo continuous smouldering) the applicable AVCP systems regarding reaction to fire are 1, or 3, or 4 depending on the conditions defined in the said Decision.

#### 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.

**Table 3 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
<b>Factory production control (FPC)</b> [including testing of samples taken at the factory in accordance with a prescribed test plan]					
Receipt of materials					
1	Specifications cardboard	Delivery ticket or label on package Checking of Supplier certificates or supplier tests	Conformity with the order <sup>1)</sup>	--	Each delivery
2	Dimensions cardboard (l, b)	EN 822	Conformity with the order	--	Each delivery
3	Squareness cardboard	EN 824	Conformity with the order	--	Each delivery
4	Layers construction of cardboard	Visual	Directions and damages	--	Each delivery
5	Moisture content cardboard	Measuring	Conformity with the order	--	Each delivery
6	Quartz sand	Delivery ticket or label on package Supplier certificates or supplier tests	Conformity with the order	-- --	Each delivery Each delivery
7	Moisture content quartz sand	Proctortest	Conformity with the order	--	Each delivery
8	Tape	Delivery ticket or label on package Supplier certificates or supplier tests	Conformity with the order	--	Each delivery

No	Subject/type of control	Test or control method	Criteria, if any	Minimum number of samples	Minimum frequency of control
Production					
9	Dimensions cardboard	Measuring	Conformity with control plan <sup>2)</sup>	--	Start of (new) production
10	Squareness cardboard	Measuring	Conformity with control plan	--	Start of (new) production
11	Moisture content cardboard	Measuring	Conformity with control plan	--	Start of (new) production
12	Layers construction of cardboard	Visual	Directions and damages	--	continuously
13	Moisture content quartz sand	Measuring	Conformity with control plan	--	Start of (new) production
14	Filling of cardboard	Visual, weighing	Conformity with control plan	--	Start of (new) production
Finished product					
15	Visual check of the product	Visual check	Adhesion of tape, damages	all	Continuously
16	Length and width	EN 822	Conformity with control plan	1	Daily
17	Thickness	EN 520 / 5.4	Conformity with control plan	1	Daily
18	Squareness	EN 824	Conformity with control plan	1	Daily
19	Flatness	EN 825	Conformity with control plan	1	Daily
20	Weight	Weighing board/dry screed and load bearing strip	According to control plan	1	Daily
21	Flexural strength	EN 520 / 5.7	Conformity with control plan	3	Every batch, min. once per month
22	Compressive strength/strain	EN 826	Conformity with control plan	3	Every batch, min. once per month
23	Surface hardness	EN 520 / 5.12	Conformity with control plan	1	Every batch, min. once per month
24	Reaction to fire	EN ISO 11925-2	Conformity with control plan	1	Every batch, min. once per month

<sup>1)</sup> Specifications of the order shall be in accordance to the control plan as agreed upon between manufacturer and TAB.

<sup>2)</sup> The control plan shall be agreed upon between manufacturer and TAB.

### 3.3 Tasks of the notified body

The intervention of the notified body under AVCP system 1 is only necessary for reaction to fire for products/materials 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 4.

**Table 4 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
<b>Initial inspection of the manufacturing plant and of factory production control</b>					
1	Control of the manufacturing plant and of the factory production carried out by the manufacturer regarding the constancy of performance related to reaction to fire and taking into account a limiting of organic material and/or the addition of fire retardant	As defined in clauses 2.2.1.1, 2.2.1.2, 2.2.2.1 and 2.2.2.2	Laid down in control plan	-	At start of production
<b>Continuous surveillance, assessment and evaluation of factory production control</b>					
2	Continuous surveillance, assessment and evaluation of the factory production control carried out by the manufacturer regarding the constancy of performance related to reaction to fire and taking into account a limiting of organic material and/or the addition of fire retardant	As defined in clauses 2.2.1.1, 2.2.1.2, 2.2.2.1 and 2.2.2.2	Laid down in control plan	-	At start of production

## 4 Reference documents

EN 520:2004+A1:2009	Gypsum plasterboards - Definitions, requirements and test methods
EN 822:2013	Thermal insulating products for building applications - Determination of length and width
EN 823:2013	Thermal insulating products for building applications - Determination of thickness
EN 824:2013	Thermal insulating products for building applications - Determination of squareness
EN 825:2013	Thermal insulating products for building applications - Determination of flatness
EN 826:2013	Thermal insulating products for building applications - Determination of compression behaviour
EN 1602:2013	Thermal insulating products for building applications - Determination of the apparent density
EN 1991-1-1+C1+C11:2019	Eurocode 1: Actions on structures - Part 1-1: General actions - Densities, self-weight, imposed loads for buildings
EN 12431:2013	Thermal insulating products for building applications - Determination of thickness for floating floor insulating products
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 12667:2001	Thermal performance of building materials and products - Determination of thermal resistance by means of guarded hot plate and heat flow meter methods - Products of high and medium thermal resistance.
EN 12939:2000	Thermal performance of building materials and products - Determination of thermal resistance by means of guarded hot plate and heat flow meter methods - Thick products of high and medium thermal resistance.
EN 13501-1:2019	Fire classification of construction products and building elements - Part 1: Classification using data from reaction to fire tests.
EN 16733:2016	Reaction to fire tests for building products - Determination of a building product's propensity to undergo continuous smouldering
EN 26891:1991	Timber structures; joints made with mechanical fasteners; general principles for the determination of strength and deformation characteristics
EN ISO 717-1:2013	Acoustics - Rating of sound insulation in buildings and of building elements - Part 1: Airborne sound insulation.
EN ISO 717-2:2013	Acoustics - Rating of sound insulation in buildings and of building elements - Part 2: Impact sound insulation.
EN ISO 6946:2017	Building components and building elements - Thermal resistance and thermal transmittance - Calculation methods.
EN ISO 10140-1:2016	Acoustics - Laboratory measurement of sound insulation of building elements - Part 1: Application rules for specific products
EN ISO 10140-2:2010	Acoustics - Laboratory measurement of sound insulation of building elements - Part 2: Measurement of airborne sound insulation.
EN ISO 10140-3:2010	Acoustics - Laboratory measurement of sound insulation of building elements - Part 3: Measurement of impact sound insulation.
EN ISO 10848-1:2017	Acoustics - Laboratory and field measurement of flanking transmission for airborne, impact and building service equipment sound between adjoining rooms - Part 1: Frame document.
EN ISO 11925-2:2010	Reaction to fire tests - Ignitability of products subjected to direct impingement of flame - Part 2: Single-flame source test
EN ISO 12572:2016	Hygrothermal performance of building materials and products - Determination of water vapour transmission properties - Cup method.

## Annex A - Instructions for tests regarding safety in case of fire

### A.1 General

Relevant product parameters to be considered for all tests as mentioned in this Annex:

- Product-type (e.g. binder type and additives including the production process).
- Thickness: the highest and lowest thickness shall be tested.
- Number of layers corrugations per thickness: products with the highest number of layers per thickness shall be tested.
- Directions of corrugations: both, parallel and crosswise corrugations shall be tested. In case of parallel corrugations only, the product shall be tested with the corrugations in vertical direction.
- Density: highest and lowest density shall be tested. The test results are valid for the entire range of density between the tested values.
- Weight per unit area: highest and lowest eight per unit area shall be tested The test results are valid for the entire range between the tested values.
- Type and thickness of lamination or coating: products without lamination or coating and with the thickest of each type of lamination or coating shall be tested.
- Type of tape(s): products with the thickest of each type of tape shall be tested.
- For any end-use conditions.

### A.2 Provisions related to reaction to fire tests

Unless mentioned otherwise in this EAD, there is no distinction in testing of board/dry screed and load bearing strip. When tested in accordance with this EAD, the results apply for board/dry screed and load bearing strip.

#### A.2.1 EN ISO 11925-2 - Ignitability test

##### a) Dimensions of the test specimens and preparation

The dimension of the test specimens shall be as prescribed in the test standard.

A lengthwise joint in the middle axis of the test specimen shall be considered for at least two tests.

Execution of the joint shall be as in end-use.

##### b) Substrate

The test specimens shall be tested free-hanging without a substrate. The test results are valid for the use of the board/dry screed on any kind of substrate of at least class E / E<sub>fl</sub> according to EN 13501-1.

##### c) Edge exposure

The test specimens shall be tested with edge exposure as well as with surface exposure. In addition, tests shall be performed on specimens turned 90 degrees on their vertical axis.

#### A.2.2 EN 13823 - Single burning item test (SBI)

Mounting of board/dry screed shall be in accordance with the following two options :

- Option 1: with an air gap behind the specimens,
- Option 2: on an appropriate substrate.

Both options shall be tested once. After these indicative tests of both options, the worst case configuration is repeated twice to cover a wide field of applications.

Remarks:

1. Mechanically fixed test specimens do not represent fixing by means of (double sided) tape or glue and therefor these methods shall be tested additionally when applicable.
2. The joints shall be executed as in end-use conditions (for example with or without glue and/or tape).

Mounting of load bearing strip shall be in accordance with the following two options :

- Option 1: with an air gap behind the specimens,
- Option 2: on an appropriate substrate.

Both options shall be tested once. After these indicative tests of both options, the worst case configuration is repeated twice to cover a wide field of applications.

Remarks:



1. Test specimens shall be mechanically fixed to the substrate according manufacturer's instructions. Mechanically fixed test specimens do not represent fixing by means of (double sided tape or glue) and therefore these methods shall be tested additionally when applicable.
2. The joints shall be executed as in end-use conditions (for example glued and/or taped or no finish).

### **A.2.3 EN ISO 1182 - Non-combustibility test**

#### a) General

This test method is performed without consideration of the end-use application of product.

#### b) Composition

The required thickness shall be achieved using the appropriate number of the thinnest thickness available, resulting in the highest amount of organic content. The results are valid for the same composition of the component with equal or lower organic content.

#### c) Density

Highest as well as lowest density of each substantial component shall be tested. The test results are valid for the entire range of density between those values tested.

### **A.2.4 EN ISO 1716 - Heat of combustion test**

#### a) General

This test method is performed without consideration of the end-use application of product.

#### b) Composition

The composition with the highest amount of organic content shall be tested. The results are valid for the same composition of the component with equal or lower organic content.

#### c) Mass/unit area

Highest as well as lowest mass/unit area (taking into account the possible range of thickness and density) of each component shall be considered when calculating the total PCS value of the product.

### **A.2.5 EN ISO 9239-1 - Determination of burning behavior of floorings**

This test method is considered not applicable since the product is not to be used without a final upper layer.

## **A.3 Provisions related to propensity to undergo continuous smouldering**

Unless mentioned otherwise in this EAD, there is no distinction in testing of board/dry screed and load bearing strip. When tested in accordance with this EAD, the results apply for board/dry screed and load bearing strip.

### **A.3.1 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.3.2 Extended application of test results**

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

- of same product-type (e.g. binder type and additives 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.

## Annex B - Creep

A single test shall be usually sufficient to determine the creep coefficient for a particular core material.

Test specimen:

- Test specimen: complete board/dry screed. The most onerous, thickest board/dry screed shall be tested.
- Conditioning of test specimen: the specimens shall be conditioned for at least 24 hours under test conditions.

Procedure:

- Test conditions:  $(23 \pm 2)$  °C and  $(50 \pm 5)$  relative humidity
- The panel shall be placed on two parallel supports rounded to a radius between 3 mm and 15 mm. The span shall be  $1/4 \times$  Length of the board/dry screed.
- The load shall be a dead weight, equal to 30 % of the failure load.
- The loads shall be placed through four constant line loads (as shown in Figure 2) extending across the full width of the board/dry screed. The loads shall be maintained perpendicular to the panel throughout the test.

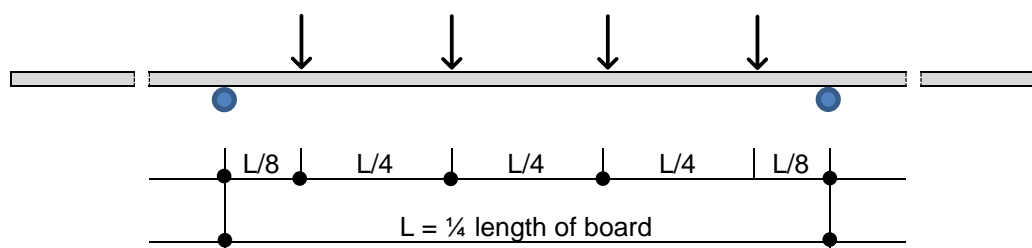


Figure 2: Loads placement for determination of creep coefficient for a particular core material

- The constant load shall be sustained undisturbed for a minimum of 2000 hours.
- During the placing of the load, the panel shall be propped from below in such a way that the propping can be removed quickly and smoothly in order to initiate the test.
- Two digital measuring devices with an accuracy of 0,1 mm shall be placed in the middle of the supports, one at each side of the board/dry screed. Measurements shall be made at least at 0,1 h, 1 h, 5 h and then 1, 2, 4, 7, 9, 11, 14, 18, 24, 32, 42, 53, 65, 80 days and at 2000 hours.
- Deflection measurements should commence the instant that the full load is applied and shall be made continuously after 1000 hours.

The creep coefficient shall be determined using the expression:

$$\varphi_t = \frac{w_t - w_0}{w_0 - w_b}$$

where:

$w_t$  = the deflection measured at time t,

$w_0$  = the initial deflection at the time  $t = 0$  and

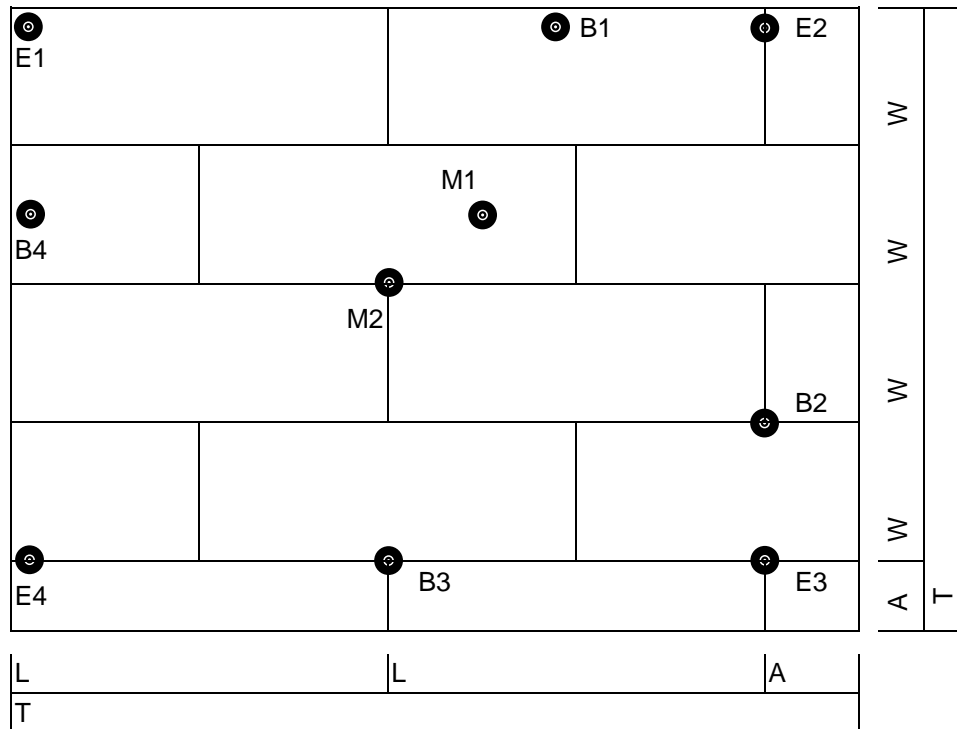
$w_b$  = the deflection caused by the elastic extension of the faces.

## Annex C - Resistance to functional failure from concentrated load

The resistance to functional failure from concentrated load is determined with a test floor area of preferably 9 m<sup>2</sup> (length: 3 m, width: 3 m) of the floor finishing system considered. The test floor shall at least accommodate testing the mentioned points of the three categories in table 5.

An illustration is given in Figure 3. The installation guide of the manufacturer shall be observed.

Figure 3: Test floor to determine resistance to functional failure from concentrated load



A = minimum dimensions ( $\geq 50$  mm) in accordance with manufacturer's instructions  
 L / W = (minimum) nominal Length and Width of one board/dry screed

Table 5: The three categories and different points at which the concentrated load is determined.

Category	Description	Points
1	Edges of the floor area	E1; E2; E3; E4
2	Border of the floor area	B1; B2; B3; B4
3	Middle of the floor area	M1, M2

Apply at each point a concentrated load of 0.2 kN over an area of 50 mm in diameter. Increase this load in steps of 0.2 kN and above a concentrated load of 1.0 kN in steps of 0.5 kN until functional failure. Determine the average deformation caused by a concentrated load of 0.8 kN, 1.0 kN, 1.5 kN, 2.0 kN, 2.5 kN, 3.0 kN, 3.5 kN, 4.0 kN and the maximum load until functional failure of each point. Determine the deformation 2 minutes after reaching the load.

The following specifications for each point have to be complied with:

- E1: on one flooring element
- E2: on the vertical joint of two flooring elements
- E3: on the corner of three flooring elements
- E4: on the horizontal joint of two flooring elements
- B1: on one flooring element, between half-length and on one third of the length
- B2: on the corner of three flooring elements
- B3: on the corner of three flooring elements
- B4: on one flooring element, half-width
- M1: on one flooring element, half-width, between half-length and on one third of the length

- M2: on the corner of three flooring elements

The average deformations shall be specified in the ETA.

Determine the maximum point load of each point. The maximum point load of the corner, board/dry screed and middle shall be specified in the ETA.

Optionally, the area loads and areas of application according to EN 1991-1-1+C1, Table 6.1 can be specified in the ETA.