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European Assessment Document for

Impact sound insulation mat with additional function of rainwater drainage and protection of external waterproofing layers

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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

The Impact sound insulation mat with additional function of rainwater drainage and protection of external waterproofing layers (hereinafter referred to as rubber fibre mat) is a rubber fibre mat made from PUR-bonded rubber granules and fibres laminated with a geotextile on top and a profiled underside.

See annex A for description of examples of the build-up using the product covered by the EAD.

The rubber fibre mats are loose laid on the flat solid substrate. The rubber fibre mats are protected by a geotextile and the joints between the rubber fibre mats are covered from the sidelong overlap geotextile.

The overlaps are fixed using an adhesive tape or a hook-and-loop tape to ensure that no gaps occur. Insulating edge strips are used on all rising construction elements in order to avoid structure-borne sound bridges.

This EAD covers rubber fibre mats made from rubber granulates and fibres that do not contain waste source materials.

The as rubber fibre mat is covered by various types of covering, such as terrace slabs on gravel or pedestals, timber decking, ceramic tile decking. See examples annex A.

The product is not covered by a harmonized 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 use(s)

The rubber fibre mats are used for the improvement of impact sound insulation of external floors and rainwater drainage and protection of water proofing layers.

The rubber fibre mats are installed on top of a possible watertight layer. The rubber fibre mats can be used on roofs under

- split (gravel) filling with terrace slabs, made of concrete, natural stone or similar build-up.
- timber beams with timber decking, timber tiles, timber boards or similar build-up.
- pedestals with terrace slabs, ceramic plates or timber decking or similar build-up.

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 rubber fibre mat for the intended use of 10 years when installed in the works (For parts subject to wear: The assumed service life for gaskets is 5 years). 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[1].

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 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 the assumed working life.

2 ESSENTIAL CHARACTERISTICS AND RELEVANT ASSESSMENT METHODS AND CRITERIA

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

2.1 Essential characteristics of the product

Table 2.1.1 shows how the performance of the as rubber fibre mat with additional function of rainwater drainage and protection of external waterproofing layers is established 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	External fire performance of roofs	2.2.13	Class
Basic Works Requirement 4: Safety in use			
2	Tensile strength and elongation at break	2.2.2	Level
3	Stress-strain characteristics in compression	2.2.3	Level
4	Dynamic stiffness	2.2.4	Level
5	Compressibility	2.2.5	Level
6	Compressive stress and creep	2.2.6	Level
7	Deformation under specified load and temperature conditions	2.2.7	Level
8	Water flow capacity	2.2.8	Level
9	Dimensional stability	2.2.10	Level
Basic Works Requirement 5: Protection against noise			
10	Impact sound reduction	2.2.11	Level
Basic Works Requirement 6: Energy economy and heat retention			
11	Thermal resistance	2.2.12	Level
Aspects of Durability			
12	Resistance to: - Oxidation - Hydrolysis - Ozone - Weathering - Freeze/thaw	2.2.9	Level/Description

2.2 Methods and criteria for assessing and classification of 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 Reaction to fire

The rubber fibre mat shall be tested, using the test method(s) relevant for the corresponding reaction to fire class according to EN 13501-1. The rubber fibre mat shall be classified according to the Commission Delegated Regulation (EU) 2016/364 in connection with EN 13501-1. The class and the applicable field of application is stated in the ETA.

2.2.2 Tensile strength and elongation at break

The tensile strength and elongation at break of the rubber fibre mat are determined in accordance with EN ISO 1798 with test specimen type 1 according to EN ISO 1798/Figure 1/a) used for the testing. The tensile strength and elongation at break are stated in the ETA.

2.2.3 Stress-strain characteristics in compression

The stress-strain characteristics in compression of the rubber fibre mat are determined in accordance with EN ISO 3386-2. The level is stated in the ETA.

2.2.4 Dynamic stiffness

The dynamic stiffness $s´$ or $s_{t}´$ of the rubber fibre mat is tested in accordance with EN 29052-1. The level is stated in the ETA.

2.2.5 Compressibility

The compressibility of the rubber fibre mat is determined as $c = d_L – d_B$ with d_L and d_B determined in accordance with EN 12431. The maximum level is stated in the ETA.

2.2.6 Compressive stress and creep

The compressive stress of the rubber fibre mat is determined in accordance with section 8.3 of EN 826 and the compressive creep is determined in accordance with EN ISO 16534 where the sample preparation is made with storage in water for 123 days and with an imposed load of 3,9 kN (corresponding to stress section $\sigma_c = 0{,}35 \times \sigma_{10}$). The size for the test specimen is 150 mm x 150 mm x d mm, where d is the thickness of the assessed product.

The minimum level of the compressive stress, σ_{10}, is stated in the ETA. The compressive creep and the total thickness reduction are calculated on the basis of linear regression in accordance with annex A of EN ISO 16534 with an extrapolation time of 10 years and are given in the ETA.

2.2.7 Deforrubber fibre mation under specified load and temperature conditions

The deformation of the rubber fibre mat under specified load and temperature conditions is determined in accordance with test condition 2 in EN 1605 where the sample preparation is made with storage for 168 hours at 70º and with an applied load of 40 kPa.

The maximum change of the relative deformation and the used test condition are stated in the ETA.

2.2.8 Water flow capacity

The water flow capacity of the rubber fibre mat is determined in accordance with EN ISO 12958-1. The mean in-plane water flow capacity and the corresponding test conditions (e.g., which surface of the drainage layer is up/down, due to the fact that the flow to drain penetrates from one face only) are stated in the ETA.

Note. EN ISO 12958-1 is considered to be applicable for the assessment of the water flow capacity of the product covered by the EAD, due to the fact that the principles for the water flow in the products covered by this EAD are similar to the ones described in EN 12958-1 section 4 and that the water flow capacity of the product is governed by the geotextile layer.

2.2.9 Resistance to ageing

2.2.9.1 Resistance to oxidation

The resistance to oxidation of the rubber fibre mat is determined in accordance with EN ISO 13438 method B. The the compressive stress, σ_{10} after ageing is stated in the ETA.

2.2.9.2 Resistance to hydrolysis

The resistance to hydrolysis of the rubber fibre mat is determined in accordance with EN 12447.

The change in compressive stress at 10% compression in % and the change in dynamic stiffness in % are stated in the ETA.

2.2.9.3 Resistance to ozone

The resistance to ozone of the rubber fibre mat is determined in accordance with EN 1844, but with samples with dimensions 200 mm × 200 mm. It is stated in the ETA if the tested sample showed no cracking or cracking.

2.2.9.4 Resistance to weathering

The resistance to weathering of the rubber fibre mat is determined in accordance with EN 12224 with UV fluorescent lamp type 1 in accordance with section 4.1 of EN 12224 with wave lengths of 340 nm.

The change in compressive stress at 10% compression in % and the change in dynamic stiffness in % are stated in the ETA.

2.2.9.5 Resistance to freeze/thaw

The resistance to freeze/thaw of the rubber fibre mat is determined in accordance with EN 12091 where the sample preparation is made with storage in water. The test principle b) is applied and the water absorption in grams before and after ageing is stated in the ETA.

2.2.10 Dimensional stability

The dimensional stability of the rubber fibre mat is determined in accordance with EN 1604. The samples are conditioned in accordance with section 6.4 of EN 1604, and the tests are performed in accordance with section 7.2 of EN 1604 with test conditions at 70 (±2) ºC at 90% (±5%) relative humidity for 48 (±) hours. The dimensional changes, $\Delta\varepsilon_l$, $\Delta\varepsilon l_b$ and $\Delta\varepsilon_d$. are stated in the ETA.

2.2.11 Impact sound reduction

The impact sound reduction of the rubber fibre mat is tested in accordance with EN ISO 10140-1, EN ISO 10140-3, EN ISO 10140-4 and EN ISO 10140-5 as appropriate using the provisions of category II according to Annex H, clause H.2.2.2 of EN ISO 10140-1. Using this data, the weighted impact sound reduction ΔL_w shall be calculated according to EN ISO 717-2.

The test shall be performed with the build-up representing the worst case for impact sound reduction (e.g., minimum mass per unit area of the covering, on the thinnest water proofing layer, thinnest insulation layer and the thinnest rubber fibre mat covered by the ETA). If need be, the tests shall be carried out with several build-ups. The results will apply for build-ups with higher mass per unit area, thicker water proofing layers and thicker insulation layers than the build-up tested

The weighted impact sound reduction ΔL_w (if need be, for different build-ups) shall be given in the ETA considering a reduction of 2 dB to take influence of ageing into account.

Assessed $\Delta L_w = \Delta L_w - 2$ dB

The assessed floor build-up shall be described in detail in the ETA. Application of results – included extended application – of the assessed build-up for other build-ups shall be clearly stated.

Note. The performance stated in the ETA apply to the tested configuration only.

2.2.12 Thermal resistance

The thermal resistance and/or thermal conductivity of the rubber fibre mat is determined in accordance with EN 12664. 5 samples with dimensions 500 x 500 mm and thickness corresponding to the tested product are subjected to the test. The samples are conditions for 6 hours at 23±2°C and 50±5 % relative humidity prior to testing.

The guarded hot plate method is applied in accordance with section 5.2 of EN 12664. For the test, two panels were placed one on top of the other so that the profiling fits together. In accordance with figure 1 of EN 12664, the two-specimen apparatus is used. During of the measurement, a constant heat flow is adjusted, from which together with the surface temperatures, the thermal resistance calculated.

The mean value of the thermal resistance from the 5 samples and the method used in the test are given in the ETA.

2.2.13 External fire performance of roofs

The rubber fibre mat may partly represent the outer layer of the roof covering and might, thus, be exposed to external fire. Thus, the roof (including the complete roof covering) in which the rubber fibre mat is intended to be incorporated, installed or applied shall be tested according to the test method(s) referred to in EN 13501-5 and relevant for the corresponding external fire performance roof class, in order to be classified according to Commission Decision 2001/671/EC amended by Commission Decision 2005/823/EC

The class and the applicable field of application – based on the provisions of CEN/TS 16459 - is 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: Decision 2000/273/EC as amended by 2001/596/EC. and taking into account Commission Delegated Regulation (EU) No. 2016/364

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

For uses subject to regulations on reaction to fire the applicable AVCP systems are 1, 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 rubber fibre mat 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)					
1	Geometry	EN ISO 29465 and EN 823	According to control plan	According to control plan	Once per production day
2	Mass per unit area	EN ISO 29470	According to control plan	According to control plan	Once per production day
3	Reaction to fire	According to 2.2.1 of this EAD	According to control plan	According to control plan	Once per year
4	Dynamic stiffness	According to 2.2.4 of this EAD	According to control plan	According to control plan	Once per production day
5	Impact sound reduction	According to 2.2.11 of this EAD	According to control plan	According to control plan	Once per 2 years*)
6	Stress-strain characteristics in compression	According to 2.2.3 of this EAD	According to control plan	According to control plan	Once per production day

*) indirect testing in accordance to the manufacturers' methods. To be determined on a case-by-case basis under the condition that a causal relation between e.g., main property (e.g., impact sound reduction) and alternate property (e.g., density), is confirmed.

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 3.3.2

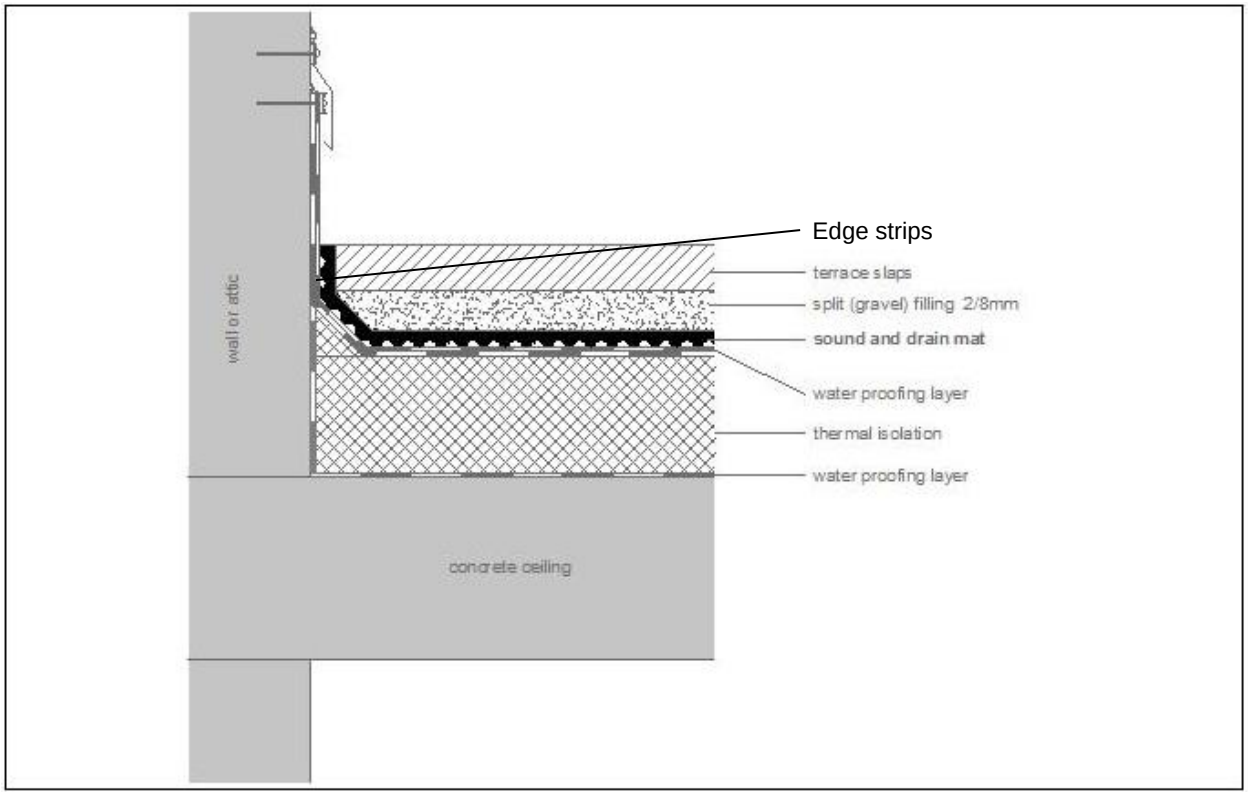
Table 3.3.2 Control plan for the notified body; cornerstones

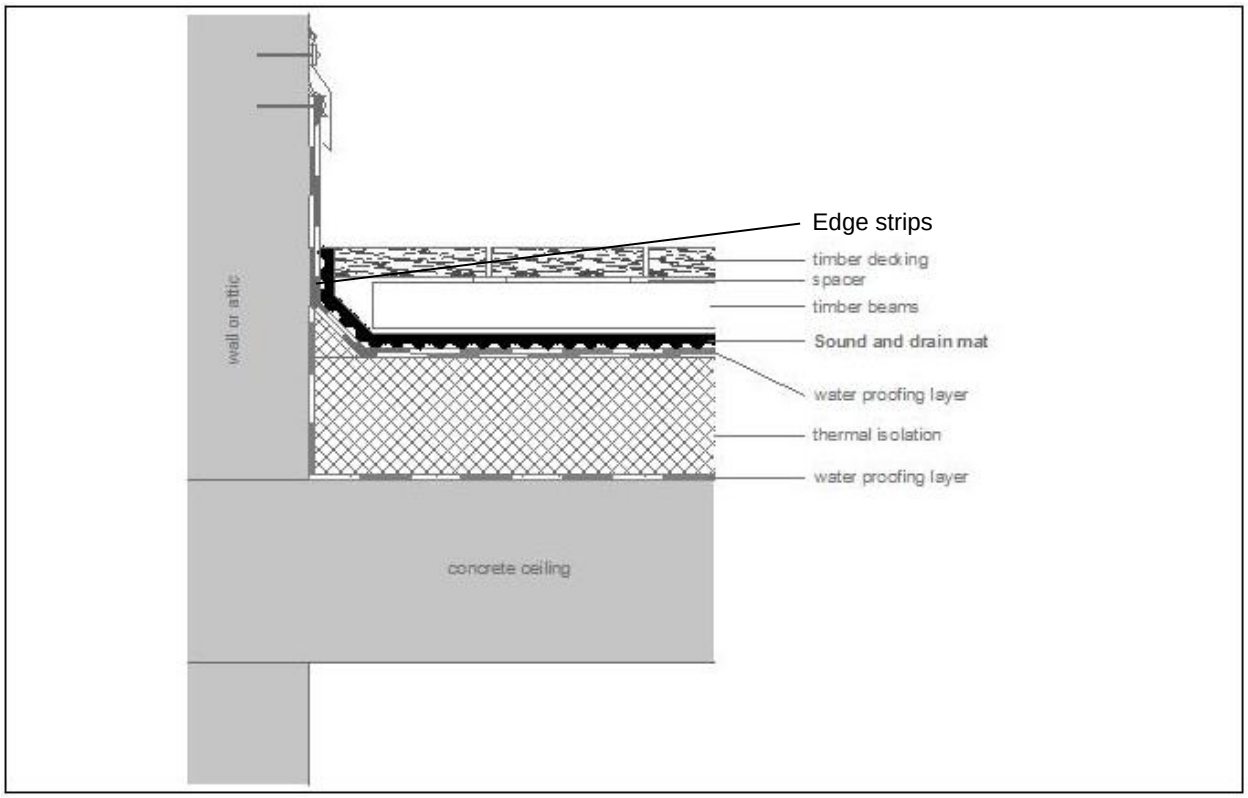
No	Subject/type of control	Test or control method	Criteria, if any	Minimum number of samples	Minimum frequency of control
Initial inspection of the manufacturing plant and of factory production control carried out by the manufacturer regarding the constancy of performance related to reaction to fire *(for system 1 only)*					
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, 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 limiting 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 a new line
Continuous surveillance, assessment and evaluation of factory production control carried out by the manufacturer regarding the constancy of performance related to reaction to fire *(for system 1 only)*					
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 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 limiting 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	1/year

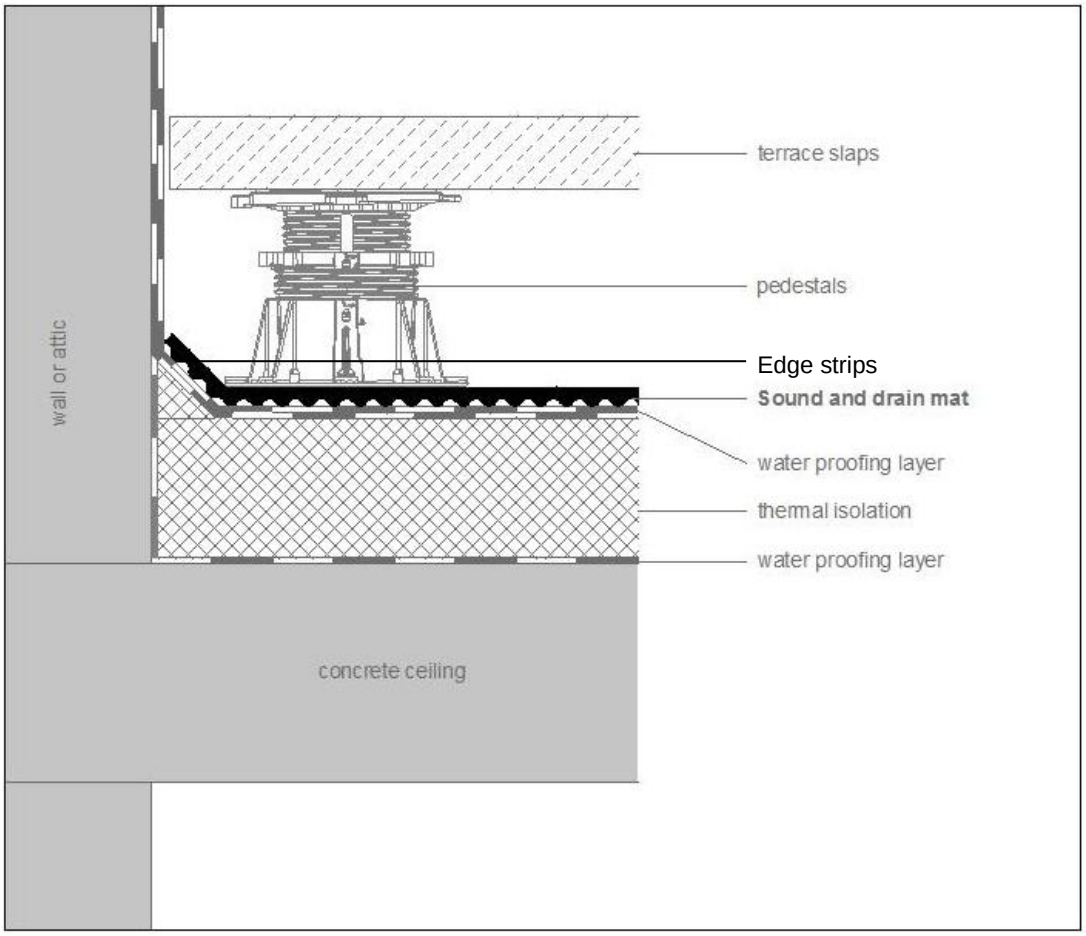
4 REFERENCE DOCUMENTS

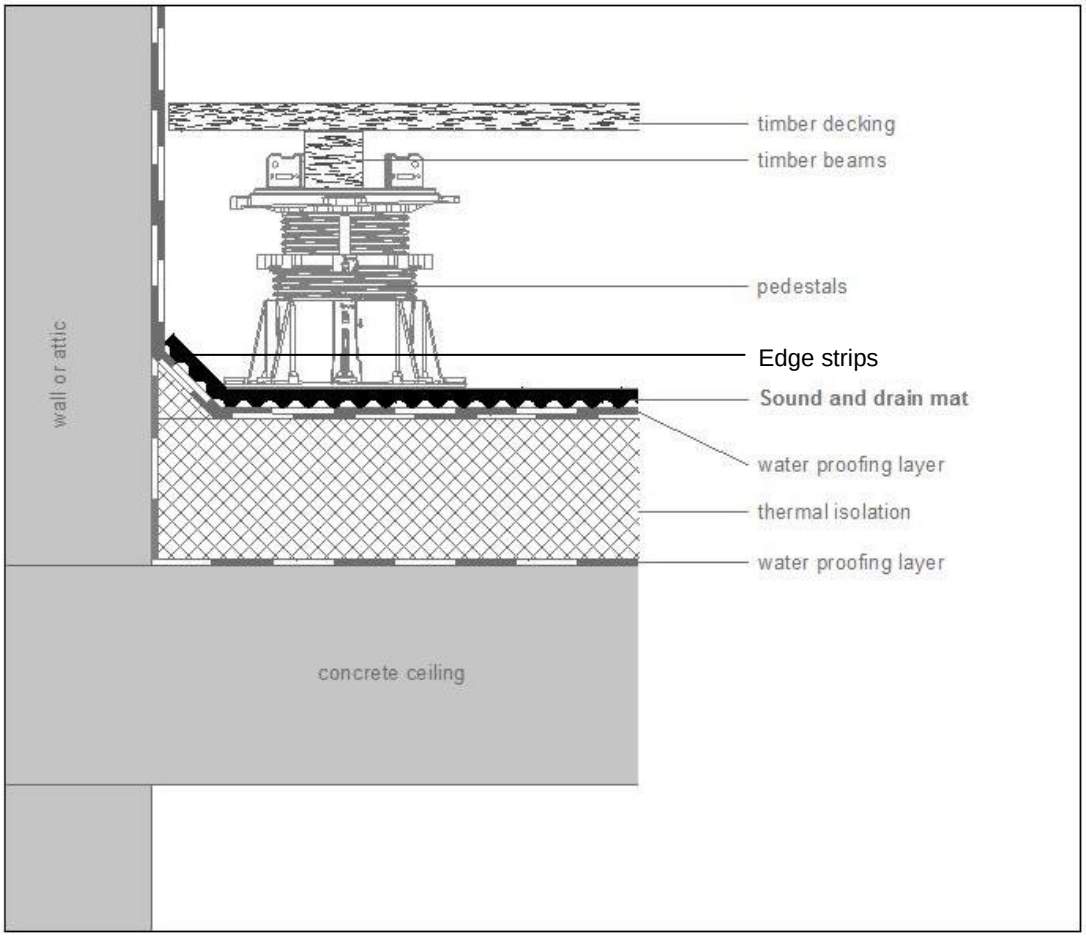
EN 13501-1:2018	Fire classification of construction products and building elements - Part 1: Classification using test data from fire reaction to fire tests
EN ISO 1798:2008	Flexible cellular polymeric materials – Determination of tensile strength and elongation at break
EN ISO 3386-2:1998	Flexible cellular polymeric materials – Determination of stress-strain characteristics in compression – Part 2: High-density materials
EN ISO 29470:2020	Thermal insulating products for building applications – Determination of the apparent density
EN 29052-1:1992	Acoustics – Determination of dynamic stiffness – Part 1: Materials used under floating floors in dwellings
EN ISO 16534:2020	Thermal insulating products for building applications – Determination of compressive creep
EN ISO 12958-1:2020	Geotextiles and geotextile-related products – Determination of water flow capacity in their plane
EN 13438:2018	Geosynthetics – Screening test method for determining the resistance of geotextiles and geotextile-related products to oxidation
EN 12447:2021	Geotextiles and geotextile-related products – Screening test method for determining the resistance to hydrolysis in water
EN 1844:2013	Flexible sheets for waterproofing – Determination of resistance to ozone – Plastic and rubber sheets for roof waterproofing
EN 12224:2000	Geotextiles and geotextile-related products – Determination of the resistance to weathering
EN 12091:2013	Thermal insulating products for building applications – Determination of freeze-thaw resistance
EN 1604:2013	Thermal insulating products for building applications – Determination of dimensional stability under specified temperature and humidity conditions
EN ISO 10140-1:2021	Acoustics - Laboratory measurement of sound insulation of building elements - Part 1: Application rules for specific products
EN ISO 10140-3:2021	Acoustics – Laboratory measurement of sound insulation of building elements – Part 3: Measurement of impact sound insulation
EN ISO 10140-4:2021	Acoustics - Laboratory measurement of sound insulation of building elements - Part 4: Measurement procedures and requirements
EN ISO 10140-5:2021	Acoustics – Laboratory measurement of sound insulation of building elements – Part 5: Requirements for test facilities and equipment
EN ISO 717-2:2020	Acoustics – Rating of sound insulation in buildings and of building elements – Part 2: Impact sound insulation
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 ISO 29465:2022	Thermal insulating products for building applications – Determination of length and width
EN 823:2013	Thermal insulating products for building applications – Determination of thickness
EN 12431:2013	Thermal insulating products for building applications – Determination of thickness for floating floor insulating products
EN 826:2013	Thermal insulating products for building applications – Determination of compression behaviour
EN 1605:2013	Thermal insulating products for building applications – Determination of deformation under specified compressive load and temperature conditions
CEN/TS 16459:2019	External fire exposure of roofs and roof coverings – Extended application of test results from CEN/TS 1187

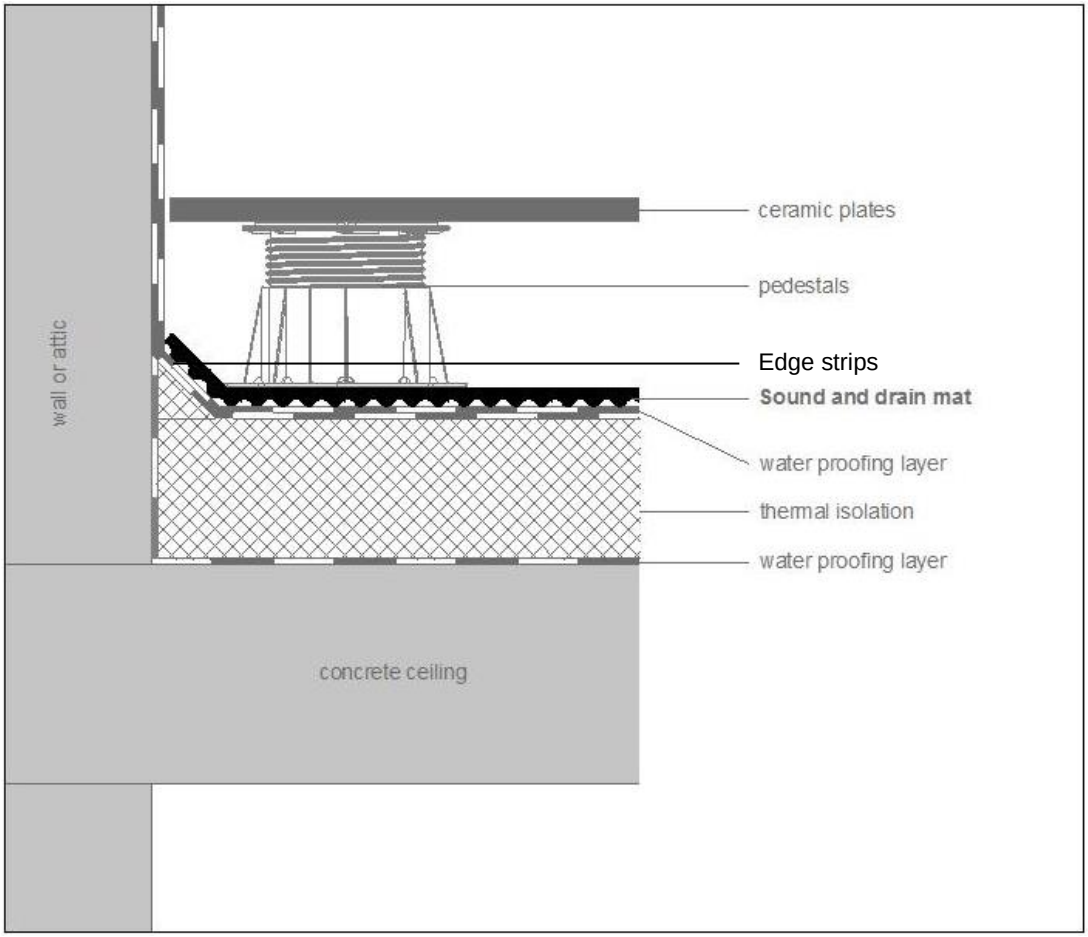
ANNEX A ILLUSTRATIONS/EXAMPLES OF THE CONSTRUCTION PRODUCT AND INTENDED USE






terrace slaps
pedestals
Edge strips
Sound and drain mat
water proofing layer
thermal isolation
water proofing layer
wall or attic
concrete ceiling


timber decking
timber beams
pedestals
Edge strips
Sound and drain mat
water proofing layer
thermal isolation
water proofing layer
wall or attic
concrete ceiling


ceramic plates
pedestals
Edge strips
Sound and drain mat
water proofing layer
thermal isolation
water proofing layer
wall or attic
concrete ceiling