



EUROPEAN ASSESSMENT DOCUMENT

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TERRACE DECKING KIT

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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

Terrace decking kit consists of decking profiles, support rail profiles, cover strip profiles and fastening devices. All profiles are made of plastic- natural fibre composite materials. Support rail profiles can also be made of aluminium. Fastening clamps are made either of the same plastic- natural fibre composite material, plastics, aluminium or steel.

The matrix of composite profiles is thermoplastic polyolefin based, but it can also be PVC or polyester or polyamide. The fibres are mainly natural fibres. Product includes also additives and processing agents such as colorants, fillers, compatibilizers, slip agents, and UV-stabilizers.

The cross section of decking profiles is 150 mm x 28 mm and support rail profiles 60 mm x 40 mm. The sizes of cover strip profiles and fastening devices can vary.

Fastening clamps are fastened onto support rails in the cases the decking kit is used on concrete or other smooth surface. Fastening clamps are fastened into load bearing timber structures in the cases the decking kit is used on load bearing timber substrate. The screws, which shall have CE-marking, are not part of the kit.

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 use(s)

Terrace decking kit is intended to be used as flooring construction of the external terraces connected to the buildings.

The support rail profiles are installed always on horizontal load bearing substrate like concrete or levelled firm drained gravel and fastened into substrate with steel screws or anchors if necessary. The decking profiles are installed on to support rail profiles or on to timber beams with hidden fastening using fastening devices and screws. The spacing between the support profiles shall be given in the ETA. Cover strip profiles are used to cover the ends of the decking profiles.

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 terrace decking kit for the intended use of 10 years when installed in the works (provided that the terrace decking kit is subject to appropriate installation (see 1.1)). 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 works¹.

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 referred to above.

2 ESSENTIAL CHARACTERISTICS AND RELEVANT ASSESSMENT METHODS AND CRITERIA

2.1 Essential characteristics of the product

Table 1 shows how the performance of terrace decking kit is assessed in relation to the essential characteristics.

Table 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 (<i>level, class, description</i>)
Basic Works Requirement 2: Safety in case of fire			
1	Reaction to fire	clause 2.2.1	class
Basic Works Requirement 3: Hygiene, health and the environment			
2	Influence of moisture	clause 2.2.2	level
Basic Works Requirement 4: Safety and accessibility in use			
3	Bending strength and modulus of elasticity	clause 2.2.3	level
4	Impact strength	clause 2.2.4	description
5	Creep factor	clause 2.2.5	level
6	Slipperiness	clause 2.2.6	level, description
7	Pull-through strength of the screw	clause 2.2.7	level
8	Moisture resistance under cyclic conditions	clause 2.2.8	level
9	UV-radiation resistance	clause 2.2.9	level
10	Thermal expansion	clause 2.2.10	level
11	Resistance against termites	clause 2.2.11	description
12	Surface hardness	clause 2.2.12	level
13	Density	clause 2.2.13	level

No	Essential characteristic	Assessment method	Type of expression of product performance (level, class, description)
Basic Works Requirement 6: Energy economy and heat retention			
14	Thermal conductivity	clause 2.2.14	level

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

Characterisation of products to be assessed shall be done in accordance with available specifications, notably material properties and dimensions.

2.2.1 Reaction to fire

The terrace decking kit components: decking profiles, support rail profiles and cover strip profiles shall be tested, using the test method according to EN ISO 11925-2 in order to be classified as E_{fl} according to EN 13501-1. The decking profiles shall also be tested using the test method according to EN ISO 9239-1 in order to be classified as D_{fl}, C_{fl} or B_{fl} according to EN 13501-1.

If the composition of the terrace decking kit components is varying, the reaction to fire test shall be made for worst mixing ratio regarding to reaction to fire properties. Worst mixing ratio will be chosen based on the fire properties of the raw materials.

The fastening devices are considered as small components and need not to be tested and classified separately according to *EOTA TR 021*.

The support rail profiles made of aluminium are considered to satisfy the requirements for performance class A1 of the characteristic reaction to fire in accordance with the EC Decision 96/603/EC (as amended) without the need for testing on the basis of it fulfilling the conditions set out in that Decision and its intended use being covered by that Decision.

The reaction to fire class shall be given in the ETA according to the standard EN 13501-1.

2.2.2 Influence of moisture

The swelling in thickness and water absorption shall be determined according to the standard EN 15534-1, clause 8.3.1. The test pieces shall be conditioned at (50 ± 5) % RH and (23 ± 2) °C for a week. The immersion time shall be 28 days in water at a temperature (20 ± 2) °C.

The results of swelling in thickness and moisture absorption shall be given in the ETA.

2.2.3 Bending strength and modulus of elasticity

Determination of the bending properties shall be done according to the standard EN 310. The size of the test piece is: length shall be 20 times the nominal thickness plus 50 mm, width shall be (50 ± 1) mm.

The bending modulus of elasticity and bending strength shall be given in ETA.

2.2.4 Impact strength

Determination of the impact strength shall be done according to the standard EN 477. The test pieces shall be conditioned at temperatures (23 ± 2) °C and -10 °C. The falling height shall be (1000 ± 5) mm from the top surface of the specimen. The result of the test shall be “pass” or “fail”. Failure occurs when the impacted surface of the specimen splits or cracks.

The energy levels for the impact resistance according to the striker mass are:

Striker mass (g)	Energy level (J)	Code
100	01	(temperature, energy level)
200	02	(temperature, energy level)
300	03	(temperature, energy level)
400	04	(temperature, energy level)
500	05	(temperature, energy level)
1 000	10	(temperature, energy level)
1 500	15	(temperature, energy level)
2 000	20	(temperature, energy level)
$m \times 500$ ^a	$5xm$	(temperature, energy level)

^a m is an integer.

The impact strength at both temperatures +23 °C and -10 °C shall be coded according to the energy level and temperature. Results shall be given in ETA.

2.2.5 Creep factor

Determination of the creep factor shall be done according to the standard EN 1156. The width of the test piece shall be 150 mm and the length shall be 500 mm. The conditioning of the test specimens shall be as specified in the standard EN 1156 for each service class. The method used shall be method 1 as specified in the standard EN 1156, clause 4.2.2.

The creep factor shall be given in ETA.

2.2.6 Slipperiness

Determination of the slipperiness shall be done according to the standard EN 15534-1, clause 6.4.2. The measurements shall be made both longitudinal and cross direction of the test specimen for every surface structure type.

The results shall be given in ETA.

2.2.7 Pull-through strength of the screw

The pull-through strength of the screw shall be tested according to the standard EN 1383. The loading arrangement in pull through capacity tests is presented in the Annex 2.

The result shall be given in ETA.

2.2.8 Moisture resistance under cyclic conditions

The moisture resistance under cyclic conditions shall be tested according to the standard EN 15534-1, clause 8.3.2. The modulus of elasticity in bending and the bending strength shall be determined after cyclic treatment as described in clause 8.3.2 of standard EN 15534-1. Test specimens and the number of the specimens shall be the same as in clause 2.2.3.

The mean decrease and the maximum individual decrease of modulus of elasticity in bending and bending strength shall be given in ETA.

2.2.9 UV-radiation resistance

The UV-radiation resistance shall be tested according to the standard EN ISO 4892-2, method A.

Charpy impact strength before and after UV exposure shall be measured according to EN ISO 179-1. The size of the test specimen shall be: $h = 4 \pm 0,2 \text{ mm}$ x $b = 10 \pm 0,2 \text{ mm}$ x $L = 80 \pm 2 \text{ mm}$.

The Charpy impact strength shall be given in ETA.

2.2.10 Thermal expansion

The thermal expansion coefficient is measured with dilatometer in the use temperature area of the product. The size of the specimens shall be $4 \times 10 \times 45 \text{ mm}^3$. The test parameters shall be:

Atmosphere	flowing air, 6 ml/min
Furnace and measuring rod	quartz glass
Thermocouples	NiCr – CuNi
Scales	dL 250 μm , dL/dT 100 μV

The temperature program shall be:

Phase of the program	Temperature and time
Cooling	+20 °C → -40 °C, 2 °C/min
1. Holding of the temperature	-40 °C, 1 h
Heating	-40 °C → +80 °C, 2°C/min
2. Holding of the temperature	+80 °C, 1 h
Cooling	+80 °C → -40 °C, 2 °C/min
3. Holding of the temperature	-40 °C, 1 h
Heating	-40 °C → +80 °C, 2°C/min
4. Holding of the temperature	+80 °C, 1 h
Cooling	+80 °C → +20 °C, 2 °C/min
5. Holding of the temperature and end of the program	+20 °C, 3 h

The value shall be given in ETA. Installation instructions shall give information of the extreme use conditions (upper and lower temperature limits).

2.2.11 Resistance against termites

The resistance against termites shall be determined according to the standard EN 117 with the changes given in the standard EN 15534-1, clause 8.4.

The result shall be given in ETA.

2.2.12 Surface hardness

The surface hardness shall be tested according to the standard EN 1534. The place for indentation shall be in the middle of the significant surface between the two adjacent grooves.

The surface hardness shall be given in ETA.

2.2.13 Density

The density shall be determined according to the standard EN ISO 1183-1, method A: Immersion method.

The density shall be given in ETA.

2.2.14 Thermal conductivity

Determination of the thermal conductivity shall be done according to the standard EN 12667.

The thermal conductivity shall be given in 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 97/808/EC amended by decisions 1999/453/EC, 2001/596/EC and 2006/190/EC.

The systems to be applied are listed in Tables 2a and 2b. Table 2a applies in general applications and Table 2b applies when the reaction to fire properties are stated.

Table 2a System of assessment and verification of constancy of performance to be applied in general

Product	Intended uses	Levels or classes	Assessment and verification of constancy of performance
Terrace decking kit	For terrace decking	In all application	4

Table 2b System of assessment and verification of constancy of performance to be applied when fire requirements apply

Product(s)	Intended use(s)	Level(s) or class(es) (reaction to fire)	Assessment and verification of constancy of performance
Rigid flooring products for internal use	For internal use including enclosed public transport premises	A1 _{FL} ⁽¹⁾ , A2 _{FL} ⁽¹⁾ , B _{FL} ⁽¹⁾ , C _{FL} ⁽¹⁾	1
		A1 _{FL} ⁽²⁾ , A2 _{FL} ⁽²⁾ , B _{FL} ⁽²⁾ , C _{FL} ⁽²⁾ , D _{FL} , E _{FL}	3
		(A1 _{FL} to E _{FL}) ⁽³⁾ , F _{FL}	4
System 1: See Directive 89/106/EEC Annex III.2.(i), without audit-testing of samples System 3: See Directive 89/106/EEC Annex III.2.(ii), second possibility System 4: See Directive 89/106/EEC Annex III.2.(ii), third possibility (1) 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) (2) Products/materials not covered by footnote (1) (3) Products/materials that do not require to be tested for reaction to fire (e.g. Products/materials of class A1 according to Commission Decision 96/603/EC, as amended)			

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 (product, raw/constituent material, component - indicating characteristic concerned)	Test or control method (refer to 2.2 or 3.4)	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	Visual inspection and dimensions of decking profiles, support rail profiles and cover strip profiles		control plan	control plan	Each batch
2	Swelling in thickness and water absorption of decking profiles, support rail profiles and cover strip profiles	2.2.3	control plan	control plan	Twice a day
3	Bending strength (EN 310) of decking profiles	2.2.4	control plan	control plan	Each batch
4	Chemical composition of raw material	Chemical analysis or material certificate			Each raw material batch
5	Visual inspection and dimensions of composite, aluminium or steel fastening T-clips		control plan	control plan	Each delivery
6	Material specification of composite, aluminium or steel fastening T-clips	Material certificate examination			Each delivery
7	Reaction to fire, direct test: EN ISO 9239-1	2.2.1	control plan	control plan	Once a year
	Reaction to fire, direct test: EN ISO 11925-2	2.2.1	control plan	control plan	Every three month
	Reaction to fire, indirect tests: mixing ratio of the components thickness dimensions density		control plan	control plan	Once per week or every batch

3.3 Tasks of the notified body

The cornerstones of the actions to be undertaken by the notified body in the procedure of assessment and verification of constancy of performance for terrace decking kit are laid down in Table 4.

Table 4 Control plan for the notified body; cornerstones

No	Subject/type of control <i>(product, raw/constituent material, component - indicating characteristic concerned)</i>	Test or control method <i>(refer to 2.2 or 3.4)</i>	Criteria, if any	Minimum number of samples	Minimum frequency of control
Initial inspection of the manufacturing plant and of factory production control <i>(for systems 1+, 1 and 2+ only)</i>					
1	Inspection of the factory and factory production control as described in the control plan	Control of devices, results and documentation of FPC			In connection of initial inspection of FPC and when relevant changes takes place
Continuous surveillance, assessment and evaluation of factory production control <i>(for systems 1+, 1 and 2+ only)</i>					
2	Inspection of the factory and factory production control as described in the control plan	Control of the documentation and results of FPC			Once a year

4 REFERENCE DOCUMENTS

As far as no edition date is given in the list of standards thereafter, the standard in its current version at the time of issuing the European Technical Assessment, is of relevance.

EN 117	Wood preservatives. Determination of toxic values against <i>Reticulitermes</i> species (European termites) (Laboratory method)
EN ISO 179-1	Plastics. Determination of Charpy impact properties. Part 1: Non-instrumented impact test
EN 310	Wood-based panels. Determination of modulus of elasticity in bending and of bending strength
EN 477	Unplasticized polyvinylchloride (PVC-U) profiles for the fabrication of windows and doors. Determination of the resistance to impact of main profiles by falling mass
EN 789	Timber structures. Test methods. Determination of mechanical properties of wood based panels
EN 1156	Wood-based panels. Determination of duration of load and creep factors
EN ISO 1183-1	Plastics. Methods for determining the density of non-cellular plastics. Part 1: Immersion method, liquid pycnometer method and titration method
EN 1383	Timber structures. Test methods. Pull through resistance of timber fasteners
EN 1534	Wood flooring. Determination of resistance to indentation. Test method
EN ISO 4892-2	Plastics. Methods of exposure to laboratory light sources. Part 2: Xenon-arc lamps
EN 12667	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 13501-1	Fire classification of construction products and building elements. Part 1: Classification using data from reaction to fire tests
EN 14342	Wood flooring and parquet. Characteristics, evaluation of conformity and marking
EN 15534-1	Composites made from cellulose-based materials and thermoplastics (usually called wood-polymer composites (WPC) or natural fibre composites (NFC)) – Part 1: Test methods for characterisation of compounds and products

ANNEX 1 – EXAMPLE OF THE TERRACE DECKING KIT



ANNEX 2 – LOADING ARRANGEMENT IN PULL THROUGH CAPACITY TESTS

