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European Technical Assessment

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General Part

Technical Assessment Body issuing the ETA and designated according to Article 29 of the Regulation (EU) Nº305/2011:	Instituto de Ciencias de la Construcción Eduardo Torroja (IETcc)
Trade name of the construction product	**DANOLOSA**
Product family to which the construction product belongs	Inverted Roof Kits based on extruded polystyrene insulation (XPS) with cement mortar protective finishing.
Manufacturer	DERIVADOS ASFALTICOS NORMALIZADOS (DANOSA), S.A c/ La Granja nº 3. 28108 ALCOBENDAS MADRID, España.
Manufacturing plant(s)	Sector 9, Polígono Industrial. 19290 – FONTANAR GUADALAJARA. Spain
This European Technical Assessment contains	14 pages. Annex 1. Contain confidential information and is not included in the ETA when that assessment is publicly available
This European Technical Assessment is issued in accordance with regulation (EU) No 305/2011, on the basis of	Guideline for European Technical Approval (ETAG) nº 031-2, used as European Assessment Document (EAD)

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SPECIFIC PARTS OF THE EUROPEAN TECHNICAL ASSESSMENT

1 Technical description of the product

This European Technical Assessment applies to the inverted roofs insulation kits with protective finishing comprising components which are factory-produced by the manufacturer (DANOLOSA). The ETA holder is ultimately responsible for the DANOLOSA of the Inverted Roof Insulation Kits specified in this ETA.

The Inverted Roof Kits use factory made composite insulation components, hereafter referred to as composite insulation, which are composed by extruded polystyrene (XPS) thermal insulation with integral protective finishing screed (porous concrete).

The thermal insulation boards are manufactured (DANOSA) using XPS boards according to EN 13164:2012+A1:2015. The extrusion skin of the surface of the XPS insulation in contact with the protective finishing is removed. The inverted roof composite insulation has a butt edge joint type and has the following dimensions: XPS length/width: 500 mm, thickness: 40 mm to 60 mm and Finishing screed length/width: 490 mm thickness:35 mm.

2 Specification of the intended use in accordance with the applicable EAD

The intended use of this loose-laid inverted roof insulation kit is to improve the thermal insulation of the roof and protection of the waterproofing membrane. This kit is installed on the waterproofing membrane in flat root with slope ≤ 5%.

The kits may be used in new or existing construction works and in the following flat roof areas: untrafficked and pedestrian trafficked areas

Where necessary the composite component is used in conjunction with a separation layer and additional ballast may be required due to wind uplift forces acting on the roof.

Apart from meeting specific insulation requirements also requirements and regulations concerning components and materials to be used in combination with the thermal insulation as well as the entire roof buildup are necessary for the successful use of the insulation in the inverted roof. Evaluation of the thermal insulation takes account of the end-use conditions.

The design values of the thermal conductivity or thermal resistance shall be laid down according to relevant national provisions

The provisions made in this ETA are based on an assumed intended working life of the assembled system at least of 10 years. The indication given on the assumed intended working life cannot be interpreted as a guarantee given by the manufacturer, but are only to be regarded as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

"Assumed intended working life" means that, when an assessment following the ETAG provisions is made, and when this working life has elapsed, the real working life may be, in normal use conditions, considerably longer without major degradation affecting the Essential Requirements.

3 Performance of the product and references to the methods used for its assessment

Assessment of the fitness of the DANOLOSA for the intended use, with regard to Essential Requirements 2, 3, 4 and 6, was performed in compliance with the “Guideline or European Technical Approval of Inverted Roofs Insulation Kits - Part 2: Insulation with Protective Finishing.

The characteristics of this Kit show values, which are within the requirements and tolerances established in the Manufacturer’s Technical Dossier (MTD)[1], and which are shown below. This assessment could be extended with other requirements applicable to dangerous substances resulting from transposed European legislation or national regulations and administrative provisions. Moreover, this assessment could be extended with other requirements applicable to the products, resulting from the application of other national regulations and administrative provisions.

[1] The manufacturer's technical dossier (MTD) comprises all information necessary for the production and the processing of the product as well as for the repair of the waterproofing made from that. IETcc checked it and it was found to be in accordance with the conditions stated in the approval and the characteristic value determined during the approval testing.
The part of the MTD to this ETA to be treated confidentially (inter alia the control plan for factory production control and initial type-testing is deposited with IETcc and, as far as this is relevant to the tasks of the notified body involved in the procedure of attestation of conformity shall be handed over to the notified body."

3.1 Characteristics of the Kit

Safety in the case of fire (BWR 2)

Fire resistance (EN 13501-1)**. Screed: Class** A1, according the inorganic composition of the concrete (≥99%). **XPS**: Class E.

External fire performance (Decision 2000/553/EC). No classification needed since the covering comply with: Sand/cement screed to a thickness of at least 30 mm.

Hygiene, health and environment (BWR 3)

Release of dangerous substances. The product does not contain or release dangerous substances according to EOTA TR 034.

Water vapour transmission.

Component	Standard (EN)	Thickness	μ
XPS	12086	37 mm	42
Screed	1015-19	35 mm	8

Safety in use (BWR 4)

Wind uplift resistance. The calculation and assessment of the suitability of the assembled system to resist wind loading shall be carried out in conjunction with the ETA Applicant, in accordance with Euro Code EN 1991-1-4 and the Nationally Determined Parameters. For each specific building, the calculation of the required ballast to resist the wind up lift force shall be carried out by the roof designer**.**

Slipperiness / wear resistance (EN 13036-4). With 4s rubber slider in dry/wet is ≥35 (65/60).

Hard body impact resistance (TR 001). The test was performed after ageing and freeze-thaw. No cracking, indentation, flaking and/or delamination of the finishing screed from the thermal insulation

Tensile bond strength (EN 1607). The test was performed after ageing and freeze-thaw ≥ 80kPa.

Static identation (Point loading) (TR 007). No degradation of the finishing screed (no cracking, indentation and/or flaking).

Energy economy and heat retention (BWR 6)

Thermal conductivity (EN 13164). λD (W/m K) = 0,034.

Correction procedure for thermal conductivity. In the following a correction procedure taking into account two levels shall be given. Level 1 applies when the freeze-thaw resistance of the thermal insulation is considered critical, level 2 applies when the freeze-thaw resistance of the thermal insulation is non-critical. It shall be up to the National Regulator which calculated value(s) apply in that country.

The corrected thermal conductivity λcor shall be determined in accordance with EN ISO 10456

Fm, Level 1	1,1015	**λcor, level 1**	0,0376
Fm, Level 2	1,0779	**λcor, level 2**	0.0366

Correction factor of thermal transmittance of the Inverted Roof Insulation Kit. Fx= 0,04

Thermal resistance of insulation (EN ISO 10456).

Thickness XPS(mm)	Levels	m^2 K/W
40	1	1,0645
	2	1,0915
50	1	1,3306
	2	1,3643
60	1	1,5968
	2	1,6372

Aspects related to durability and serviceability

Compressive strength/stress of the thermal insulation (EN 826). 300 kPa CS(10/Y)300. Category of use Pedestrian

Compressive strength of protective finish (EN 12390-3). 12,5 MPa at 28 days of curing.

Compressive creep of the thermal insulation (EN 1606). CC (2/1,5/25)50. Category of use Pedestrian

Deformation under specified compressive load and temperature of the thermal insulation (EN 1605)**.** 40 kPa at 70 ºC ≤5% (DLT (2)5).

Dimensional stability with protective finishing (EN 1604). The value obtained ≤ 5% DS (70,90)5.

Long term water absorption by diffusion (EN 12088). < 50 and ≥ 50 mm mm: ≤ 5% (WD(V)) 5

Long term water absorption by immersion (EN 12087).
XPS ≤ 0,7 (WL(T)0,7). Value obtained 0,2 initial (ITeCons ISO 129/15),
Screed (ETAG 004): 0 ,2 kg/m^2 at 1h and 0,5 kg/m^2 at 24h

Ageing of insulation with protective finishing (ETAG 004). 80 cycles. The cycles shall be as follows:
- Gradual heating to 70 ± 5ºC for one hour
- Maintain temperature at 10-15% RH for two hours
- Water spray at 15 ± 5ºC for one hour at a volume of one litre per metre squared per minute
- Leave to drain for two hours and then repeat.

Freeze-thaw – insulation with protective finishing. Following the 80 cycles of heat-rain ageing, freeze-thaw shall be carried out for 30 cycles
- Exposure to water for 8 hours at 20 ± 2ºC by total immersion
- Freezing –20 ± 2ºC (fall for 2 hours) for 14 hours (total of 16 hours)

Following completion of the conditioning shall be determined:

Tensile bond strength (EN 1607). The test was performed after ageing and freeze-thaw ≥ 80kPa. (see SAFETY IN USE):

Static identation (Point loading) (TR 007). No degradation of the finishing screed (no cracking, indentation and/or flaking).

Long term water absorption by immersion of the insulation (EN 12087). 0,6%. ETAG requirement 1%.

Compressive strength/stress of the thermal insulation (EN 826) ≤ 10% (variation of the initial value).

Chemical resistance. The ETA Applicant shall provide a list of chemicals or chemical families the insulation shall not come into contact with.

Compatibility of DANOLOSA with the other components of the assembled system. The ETA Applicant shall declare the compatibility of DANOLOSA with bitumen, TPO, EPDM, etc. membrane, except with PVC membrane, in this case it is necessary a separation layer.

Aspects of Identification of the screed

Properties	Values
Mass (kg)	15,5-17,5
Type	Porous cement concrete
Thickness (mm)	35
Density (EN 1015-10) (kg/m^3)	1,700 ± 200
Flexural strength (EN 1339) (MPa)	>3,5

4. Assessment and verification of constancy of performance (AVCP) system applied, with reference to its legal base

System of Attestation of Conformity. The European Commission according to the decision 97/566 as amended by 2001/596/EC on the Procedures of Attestation of Conformity (Annex V, clause 2 of EU Regulation 305/2011) for Inverted Roof Insulation Kits.

.Product	Intended uses	Level or Classes	System
DANOLOSA	Inverted Roof Insulation Kits	----	+2

According to this decision, system +2 establishes: *Tasks of the manufacturer:* Factory production control and Initial type-testing of the product and *Tasks of the notified body*: Initial inspection of the factory and production control and Continuous surveillance, assessment and approval of factory production control.

5 Technical details necessary for the implementation of the AVCP system, as provided for the applicable EAD

The ETA is issued for this kit on the basis of agreed data/information, deposited at IETcc, which identifies the product that has been assessed and judged. It is the manufacturer's responsibility to make sure that all those who use the kit are appropriately informed of specific conditions according to sections 1, 2, 4 and 5 including the annexes of this ETA. Changes to the membrane or the components or their production process, which could result in this deposited data/information being incorrect should be notified to the IETcc before the changes are introduced. IETcc will decide whether or not such changes affect the ETA and if so whether further assessment or alterations to the ETA shall be necessary.

5.1 Tasks of the manufacturer

Factory production control. The manufacturer shall exercise permanent internal control of production and ensure that the results obtained comply with the quality level required. All the elements, requirements and provisions adopted by the manufacturer are documented in a systematic manner in the form of written procedures and regulations. This control production system documentation ensures a common understanding of quality assurance and enables the achievement of the required product characteristics according to the ETA.

The manufacturer may only use components stated in the technical documentation of this ETA including Control Plan. The incoming raw materials are subjected to verifications by the manufacturer before acceptance.

The factory production control shall be in accordance with the Control Plan(2) which is part of the Technical Documentation of this ETA. The Control Plan has been agreed between the manufacturer and the IETcc and is laid down in the context of the factory production control system operated by the manufacturer and deposited at the IETcc. The results of factory production control shall be recorded and evaluated in accordance with the provisions of the Control Plan.

Initial type-testing of the product. Initial type-testing carried out by the IETcc is that set out in chapter 5 of the guideline for Inverted Roof Insulation Kits, part 2. Insulation with protective finishing (ETAG 031-2). The IETcc assessed the results of these tests in accordance with chapter 6 of this Guide, as part of the ETA issuing procedure.

The verifications underlying this ETA have been furnished on samples from the current production, these replace the initial type-testing. After changing the production process or starting the production in another manufacturing plant the initial type-test shall be repeated.

Other tasks of the manufacturer. The manufacturer shall, on the basis of a contract, involve a body which is notified for the tasks referred to in section 4 in the field of Inverted Roof Insulation Kits in order to undertake the actions laid down in this clause. For this purpose, the control plan shall be handed over by the manufacturer to the notified bodies involved.

For initial type – testing, the results of the tests performed as part of the assessment for the ETA shall be used unless there are changes in the production line or plant. In such cases the necessary initial type- testing has to be agreed with the IETcc.

The manufacturer shall make a declaration of conformity, stating that the construction product is in conformity with the provisions of this ETA

5.2 Tasks of the Notified body

Initial inspection of factory and production control. The notified body ascertains that, in accordance with the MTD, factory conditions and production control allow the manufacturer to ensure the consistency and homogeneity of the manufactured product and its traceability, thus guaranteeing that the final characteristics of the product are those indicated in point 2.

(2) The control plan is a confidential part of this European Technical Assessment and only handed over to the notified body involved in the procedure of attestation of conformity.

Continuous surveillance, assessment and approval of Factory Production Control. The Notified body shall visit the factory at least twice a year. Surveillance of the manufacturing process shall include:

- Checking the documentation of factory production control, to ensure continuing compliance with the provisions of the ETA,
- Identification of changes by comparing data obtained during the initial inspection or during the last inspection.

In the event the ETA provisions are not complied with, the certificate of conformity shall be withdrawn.

Issued in Madrid on 21 june 2018
by

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