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European Technical Assessment

ETA 10/0311
of 08.06.2018



General part

Technical Assessment Body issuing the ETA: ITeC	
ITeC has been designated according to Article 29 of Regulation (EU) No 305/2011 and is member of EOTA (European Organisation for Technical Assessment)	
Trade name of the construction product	COTON-FRP
Product family to which the construction product belongs	In-situ formed loose fill thermal insulation product made of cotton fibres.
Manufacturer	RMT INSULATION C. Joan Güell con C. Narcís Monturiol Polígono Industrial Can Magre ES08187 SANTA EULÀLIA DE RONÇANA (Barcelona) Spain
Manufacturing plant(s)	C. Joan Güell con C. Narcís Monturiol Polígono Industrial Can Magre ES08187 SANTA EULÀLIA DE RONÇANA (Barcelona) Spain
This European Technical Assessment contains	10 pages including 3 annexes which form an integral part of this assessment.
This European Technical Assessment is issued in accordance with Regulation (EU) 305/2011, on the basis of	European Assessment Document (EAD) 040138-01-1201 <i>In-situ formed loose fill thermal and/or acoustic insulation product made of vegetable fibres.</i>
This ETA replaces	ETA 10/0311 issued on 18.06.2013.

General comments

Translations of this European Technical Assessment in other languages shall fully correspond to the original issued document and should be identified as such.

Communication of this European Technical Assessment, including transmission by electronic means, shall be in full. However, partial reproduction may be made, with the written consent of issuing Technical Assessment Body. Any partial reproduction must be identified as such.

Specific parts of the European Technical Assessment

1 Technical description of the product

COTON-FRP is an insulating product made of loose cotton fibres.

This product consists of cotton fibres made from frayed waste textile clothes. During the manufacturing process the product is provided with fire retardants and additives for enhancing its biological resistance (anti-fungal protection). The waste cotton fibres composition used in the manufacturing process is:

- Min. 65% cotton fibres.
- Max. 35% other textile fibres.

The product is used to produce insulation layers by means of machine processing at the place of use. The machine processing is carried out in dry conditions.

The ETA has been issued for the product on the basis of agreed data/information, deposited with ITeC, which identifies the product that has been assessed. The ETA applies only to products corresponding to this agreed data/information.

COTON-FRP is also put on the market under the trade names specified in Annex 3.

2 Specification of the intended use(s) in accordance with the applicable European Assessment Document (hereinafter EAD)

COTON-FRP is used to produce thermal insulation layers not exposed to compression loads, by means of mechanical installation at the place of use. The installation of the product is carried out in dry conditions.

The product can be used for the following intended uses:

- Insulation in closed cavities in horizontal or pitched ($\leq 10^\circ$) roofs.
- Exposed insulation on horizontal or pitched ($\leq 10^\circ$) areas which are accessible – for inspection, maintenance...- but not subjected to foot traffic (e.g. insulation of top storey ceilings).

The insulation product made of cotton fibres shall not be used in structures where it will be exposed to compression loads, precipitation, wetting or weathering, nor shall be used directly in contact with water or soil nor in constructions with risk that the critical moisture content will be exceeded.

The provisions made in this ETA are based on an assumed working life of at least 50 years for COTON-FRP. These provisions are based upon the current state of the art and the available knowledge and experience.

The indications given on the working life cannot be interpreted as a guarantee given by the producer but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

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

Performance of COTON-FRP related to the basic requirements for construction works (hereinafter BWR) were determined according to EAD 040138-01-1201. Essential characteristics of COTON-FRP are indicated in table 3.1.

Table 3.1: Performances of COTON-FRP

Basic Works Requirement	ETA section	Essential characteristic	Performance
BWR 2 Safety in case of fire	3.1	Reaction to fire	Insulation material: B,s2-d0.
BWR 3 Hygiene, health and the environment	3.2	Biological resistance: resistance to growth of mould fungus.	Class 0
BWR 5 Protection against noise	---	Sound absorption	Not relevant.
	3.3	Thermal conductivity	$\lambda_{D(23,50)} = 0,046 \text{ W/(m}\cdot\text{K)}$ $f_{u,1(\text{dry-23/50})} = 1,34 \text{ kg/kg}$ $f_{u,2(23/50-23/80)} = 0,87 \text{ kg/kg}$ $F_{m1} = 1,07$ $F_{m2} = 1,07$
	3.4	Water vapour diffusion resistance	$\mu = 1 - 4$
	3.5	Water absorption	$\leq 4 \text{ kg/m}^2$
	3.6	Corrosion developing capacity	CR
BWR 6 Energy economy and heat retention	3.7	Settlement / density: a) Settlement under impact excitation. b) Settlement under vibration. c) Settlement under impact excitation + hygrothermal conditions. d) Settlement under cyclical temperature and cyclic humidity. e) Provision for calculating the thermal resistance.	a) $s_v \leq 11,8\%$ at a density of $13,8 \text{ kg/m}^3$ and a thickness of 303 mm. b) Not relevant. c) Not required if s_{cyc} is declared. d) $s_{cyc} \leq 19,5\%$ at a density of $13,5 \text{ kg/m}^3$ and a thickness of 308 mm. e) Thickness for calculation: installation thickness minus 19,5%.
	3.8	Critical moisture content	75%
	---	Specific airflow resistivity	Not relevant.
	3.9	Hygroscopic sorption properties	See the sorption and desorption curves in Annex 2.

3.1 Reaction to fire

The reaction to fire of COTON-FRP has been assessed according to EN ISO 11925-2 and EN 13823. The reaction to fire of COTON-FRP according to EN 13501-1 is class B-s2,d0.

3.2 Biological resistance

The determination of the growth of mould fungus has been done according to method A of section 2.2.5 of EAD 040138-01-1201.

The result is an intensity of growth level 0 which corresponds to the following evaluation: "No growth on microscopic examination identified" (see table 4 of EN ISO 846).

3.3 Thermal conductivity

The thermal conductivity of the product is determined according to EN 12667. The declared value of thermal conductivity is determined according to EN ISO 10456.

For the density of 13,5 kg/m³ the following thermal conductivity values have been obtained:

- The fractile value of thermal conductivity at 10 °C, at dry conditions representing at least 90% of the production with confidence limit of 90% is $\lambda_{(10, \text{dry}, 90/90)} = \mathbf{0,042 \text{ W/(m}\cdot\text{K)}$.
- The declared value of thermal conductivity for a moisture content of the insulating material at 23°C and 50% relative humidity is $\lambda_{D(23,50)} = \mathbf{0,046 \text{ W/(m}\cdot\text{K)}$ determined by conversion of the $\lambda_{(10, \text{dry}, 90/90)}$ value.
- The conversion coefficient for mass-related moisture content: $f_{u,1(\text{dry-23/50})} = \mathbf{1,34 \text{ kg/kg}}$.
- The conversion coefficient for mass-related moisture content: $f_{u,2(23/50-23/80)} = \mathbf{0,87 \text{ kg/kg}}$.
- The moisture conversion factor dry to 23 °C and 50% relative humidity: $F_{m1} = \mathbf{1,07}$.
- The moisture conversion factor 23 °C and 50% relative humidity to 23 °C and 80% relative humidity: $F_{m2} = \mathbf{1,07}$.

3.4 Water vapour diffusion resistance

Water vapour permeability (resistance to water vapour diffusion) has been assessed according to section 2.2.4 of EAD 040138-01-1201.

The water vapour resistance factor, μ , is a value between 1 to 4. The most unfavourable factor μ depending on construction should be used for calculation.

3.5 Water absorption

The determination of short term water absorption by partial immersion has been tested according to EN 1609 method A (see section 2.2.6 of EAD 040138-01-1201). The short term water absorption is $\leq 4 \text{ kg/m}^2$.

3.6 Corrosion developing capacity

The corrosion developing capacity on metal construction products has been assessed according to Annex E of EN 15101-1 (see section 2.2.7 of EAD 040138-01-1201).

The result of the test, expressed according to clause 4.3.5 of EN 15101-1, is CR (the test is passed: there is no presence of perforations in the test samples).

3.7 Settlement / density

The assessment of the settlement of the loose fill insulation for the intended use declared in section 2 has been carried out according to the methods described in the following table. The results of the test are shown in table 3.2.

Table 3.2: Settlement of COTON-FRP

Settlement	Test method	Settlement (%)	Density (kg/m ³)	Thickness (mm)
Settlement of loose fill insulation applied in ceilings (settlement under impact excitation), s_v .	Section 2.2.8.1 a) of EAD 040138-01-1201. [Annex B3 of EN 15101-1 with deviations]	≤ 11,8	13,8	303
Settlement under cyclical temperature and cyclic humidity (settlement under hygrothermal cycles), s_{cyc} .	Section 2.2.8.4 of EAD 040138-01-1201. [Annex B1 of EN 15101-1]	≤ 19,5	13,5	308

Calculation of the thermal resistance

A reduction of a 19,5% (determined from the highest value of settlement) applicable to the installation thickness has to be taken into account when calculating the thermal resistance (see section 2.2.8.5 of EAD 040138-01-1201).

3.8 Critical moisture content

Critical moisture content (the critical moisture level for mould growth on building materials) has been assessed according to section 2.2.9 of EAD 040138-01-1201. The critical moisture content according to this section is 75%.

3.9 Hygroscopic sorption properties

The hygroscopic sorption properties have been assessed according to the section 7.2 of EN ISO 12571 (see section 2.2.11 of EAD 040138-01-1201). The sorption and desorption curves are shown in Annex 2.

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

According to the decision 1999/91/EC of the European Commission¹ the system of AVCP (see EC delegated regulation (EU) No 568/2014 amending Annex V to Regulation (EU) 305/2011) given in the following table applies.

Table 4.1: Applicable AVPC system.

Product	Intended use(s)	Level or class	System
COTON-FRP	For thermal insulation uses not subject to fire regulations.	Any	3
	For thermal insulation uses subject to fire regulations.	B,s2-d0	1

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

All the necessary technical details for the implementation of the AVCP system are laid down in the *Control Plan* deposited with the ITeC², with which the factory production control shall be in accordance.

Any change in the manufacturing procedure which may affect the properties of the product shall be notified and the necessary type-testing revised according to the *Control Plan*.

Issued in Barcelona on 8 June 2018

by the Catalonia Institute of Construction Technology.



Ferran Bermejo Nualart
 Technical Director, ITeC

¹ Official Journal of the European Union (OJEU) L29/44 of 03/02/1999.

² The *Control Plan* is a confidential part of the ETA and is only handed over to the notified certification body involved in the assessment and verification of constancy of performance.

ANNEX 1: Installation and use

A1.1 Installation

Density at the built-in stage (installation density): **14,0 ± 3,0 kg/m³**. The density is determined by calculation as a quotient of the mass of the material brought in and the volume.

Note: When the application is carried out in conditions of high relative humidity, the density after the application could be higher than the installation density. It is a normal behavior of this product. It is known that in these conditions, the settlement will not be as high as the settlement of the same product applied with less relative humidity.

When calculating the thermal resistance of the construction elements, the nominal thickness of the thermal insulation layer will be the installation thickness minus 19,5% (see section 3.7 of the present ETA).

For horizontal installation the insulation layer will have a constant installation thickness that takes into consideration the projected thickness. For that purpose, suitable height marks will be arranged by the executing company before installation of the loose-fill insulation. The executing company must check both the installation thickness and the density.

In case of installation on pitched or arched areas slipping of the thermal insulation product is prevented by suitable measures.

The installation will be done by machine. The applicator will have to follow the instructions given by the manufacturer. The manual installation is only permitted in some particular zones (for example, in those which the access of the machine or the product is not possible). In this case, the applicator will install the product at the installation density above mentioned and will ensure that the product is sufficiently fluffed.

The construction will be designed and installed in such a way that no harmful condensation occurs within the works.

The thermal insulation material will only be installed far from heat sources, e.g. heating pipes or halogen lamps.

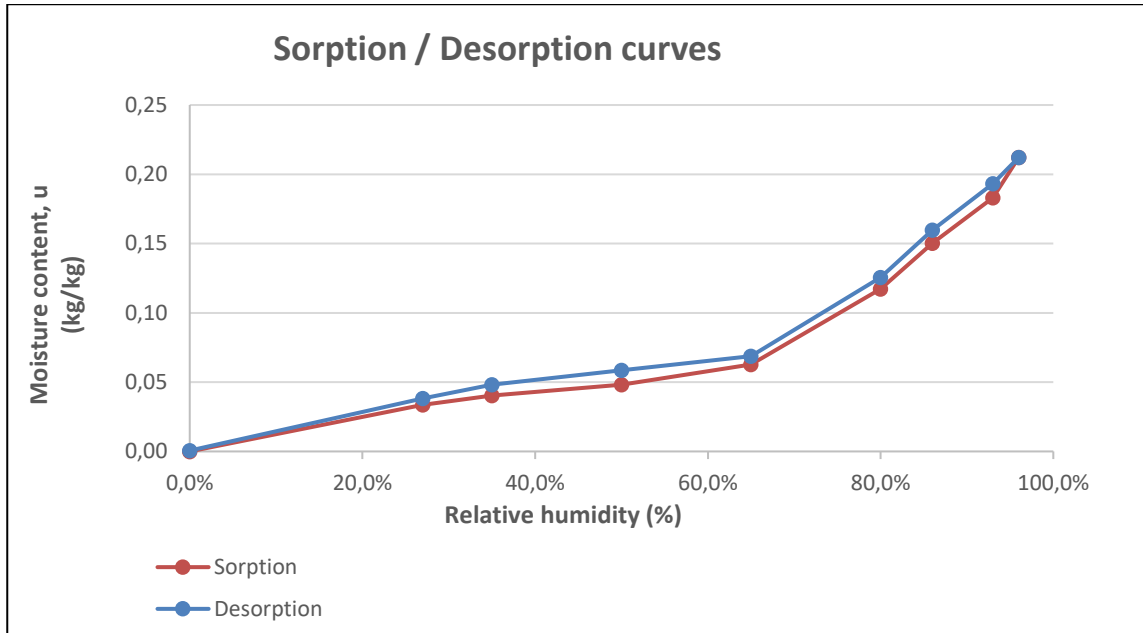
A1.2 Parameters for the installation in construction works or parts of construction works

The installation instructions given by the manufacturer will be taken into account. Mechanical processing installation of the insulation material will be performed by appropriate personnel who will have adequate experience in installing the material under the supervision of the person responsible for technical matters on site.

The use of the protection mask and safety glasses is recommended for the installation.

ANNEX 2: Sorption and desorption curves

Graph A2.1: Hygroscopic sorption and desorption curves of the product COTON-FRP.



ANNEX 3: Trade names of the product

COTON-FRP

DOMOSANIX

NITA-COTON-FRP

NITA-COTTON

ISOTEXTIL

INNOCOTON

COTON SOLIDAIRE