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**European Technical
Assessment****ETA-18/0330
of 06/06/2018**

English translation prepared by CSTB - Original version in French language

General Part

Nom commercial
Trade name

AIRFLEX / MAXIREFLEX

Famille de produit
Product family

Produit composé de faces réfléchissantes utilisé dans des procédés
d'isolation thermique de l'enveloppe d'un bâtiment.

**Product composed of reflective faces used in thermal insulation
processes of a building envelope.**

Titulaire
Manufacturer

**KdB isolation
697 rte des Chênes
73200 Gilly/Isère**

Usine de fabrication
Manufacturing plant

**KdB isolation
697 rte des Chênes
73200 Gilly/Isère**

Cette évaluation contient:
This Assessment contains

6 pages incluant 0 annexes qui font partie intégrante de cette
évaluation
*6 pages including 0 annexes which form an integral part of this
assessment*

Base de l'ETE
Basis of ETA

**Document d'Evaluation Européen (DEE) (EAD-04007-00-1201)
European Technical Assessment (EAD) (EAD-04007-00-1201)**

Cette évaluation remplace :
This Assessment replaces

ETA-08/0159

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SPECIFIC PART

1. Technical: definition of the product and intended use

This European Technical Approval applies to the following reflective product:

- AIRFLEX/ MAXIREFLEX.

The reflective product AIRFLEX/ MAXIREFLEX is composed as following:

- 2 films made up of polyethylene and having 3,7 mm thickness: one film is in air bubbles and the other one serves as the support. Each polyethylene film is of 150 μm thickness and made with an additive of flame retardant. The bubbles have a nominal diameter of 9,5mm.
- 1 foam layer of polyethylene having a nominal thickness of 3 mm and a density of 25 kg/m^3 . The foam is made with an additive of flame retardant.
- 2 aluminium layers. Each layer is constituted as following:
 - o 1 aluminium foil having thickness $\geq 30 \mu\text{m}$.
 - o 1 layers of a protective nitrocellulose lacquer (coating $<1\mu\text{m}$) which prevents the corrosion of the aluminium layer. The lacquer doesn't contain an additive of flame retardant
 - o 1 layer of polyethylene (17 μm) allowing to reinforce the adhesion of the aluminium foil on the bubble layer. Aluminium foil is fixed to bubble layer under hot conditions (without additive glue).

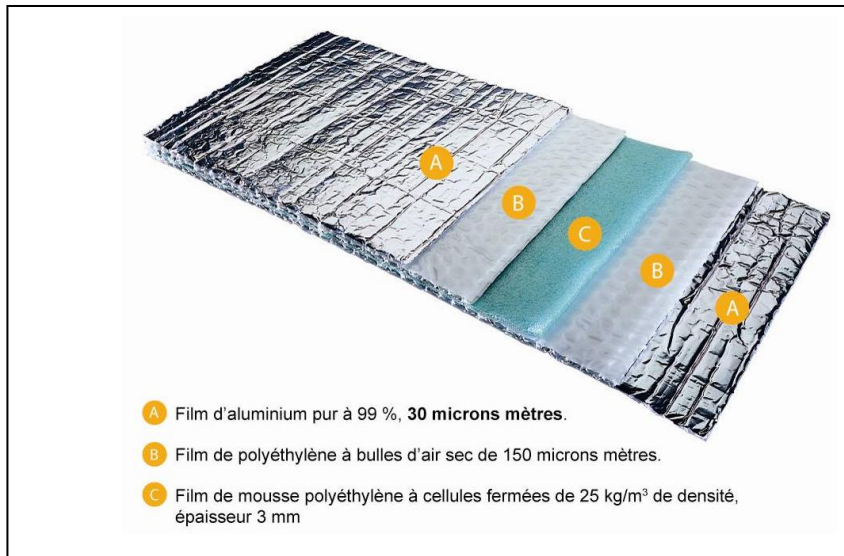
The composition of product is presented in the following table :

Tableau 1: Composition

AIRFLEX/ MAXIREFLEX	Masse per square metre (g/m^2)	Tolerance
Bubble layer (x 2)	161	$\pm 10 \text{ g/m}^2$
Polyethylene layer (x 2)	15	$\pm 2 \text{ g/m}^2$
Polyethylene foam (x 1)	83	$\pm 8 \text{ g/m}^2$
Aluminium layer 30 μm (x 2)	81	$\pm 6 \text{ g/m}^2$
Nitrocellulose lacquer (x 2)	1	$\pm 0,2 \text{ g/m}^2$

Nota : All layers are assembled by thermo-weld in the center of the breadth (or strip) and in both extremities.

On the other hand, in the extremities of the product, a film of glue " Hot Melt " of nominal width of 20 mm, is continuously deposited on the aluminium layer (on polyethylene film) to allow a stack of breadths (figure 2). This film of glue is protected by a glue paper.



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

Reflective product AIRFLEX/MAXIREFLEX is intended to be used in constructive system as an additional thermal insulation. It contributes to an increase in the thermal resistance of a thermal system in the following areas of application:

Application for walls

- Vertical walls in timber frame constructions,
- Vertical masonry walls with fixation of product on timber frame constructions or similar structures,

Application for roofs

- Pitched roof, under rafters with additional insulation over,
- Ceilings under attics under joists or timbers.

Application for ceilings / floors

- Low-floor constructions
- Intermediate ceilings.

The product is always applied on the warm side of a construction in order to avoid any condensation risk, with an additional thermal insulation product.

The thermal insulation product shall only be installed in structures where it is protected from rain, weathering and moisture.

The product is installed stretched, for example fastened on rafters, cleats or battens, by leaving possibly on both sides of the product one or two air spaces. In the absence of both possible air spaces having thermal resistance determined according to §4.2.1, the thermal resistance of the product once installed is equal to the intrinsic thermal resistance given in § .2.5.

The design value of the thermal conductivity shall be laid down according to relevant national provisions.

This European Technical Approval does not cover the complete or finished system of insulation. As for the application of all products insulating, the national codes of practice and regulations must be respected for design and implementation of construction systems.

The verifications and assessment methods on which this European Technical Assessment is based lead to the assumption of a working life of the thermal insulation products of at least 25 years. 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 references to the methods used for its assessment

The identification tests and the assessment for the intended use of this product according to the Essential Requirements were carried out in compliance with the European Assessment Document (EAD) N° 040007-00-1201 for "Thermal insulation products for buildings with radiant heat reflective components", November 2015).

Statement of dangerous substances:

According to the manufacturer's declaration taking account of EOTA TR 034, the product installed does not contain and release any dangerous substance.

3.1. Dimensions

Length and width

Length and width are determined according to EN 822.

The nominal length and width are:

Length : 25 ou 12,5 m -0 % +2 %.

Width : 1,20 m \pm 1 %.

Thickness

The thickness of the product is determined according to European standard EN 823.

The nominal thickness is given according to its tolerance as follows :

Thickness: 10,1 mm \pm 10 %.

3.2. Mass per square meter

Mass per square metre is determined according to the standard EN 1606

The nominal value of mass per square metre is given according to its tolerance as follows :

Mass per square metre: 600 g/m² \pm 5 %

3.3. ER.2 Safety in case of fire

Reaction to fire

The insulation product is tested according to EN 15715 and annex A of EAD 040007-00-1201 : December 2015 for mounting and fixing. The fire class of performance is determined according to EN 13501-1.

The classification of the product is: Euroclass B-s1, d0

3.4. ER.3 Hygiene, health and environment

Resistance to water vapour

The water vapour diffusion resistance μ is determined according the EN 12572, condition C.

The nominal value μ is higher or equal than 3 104.

The thickness of equivalent layer of air having an equivalent vapour diffusion resistance is :
Sd = 304 m.

VOC (volatile organic compounds)

The VOC emissions of AIRFLEX/ MAXIREFLEX have been determined according to ISO 16000 parts -3, -6, -9, -11.

The result of VOC emissions is: A+

Table : VOC (volatile organic compounds)

	Concentration after 28 days $\mu\text{g}/\text{m}^3$
TVOC	<2
Formaldehyde	<3
Acetaldehyde	<2
Toluene	<2
Tetrachloroethylene	<2
Ethylbenzene	<2
Xylene	<2
Styrene	<2
2-Butoxyethanol	<2
Trimethylbenzene	<2
1,4-Dichlorobenzene	<2

In addition to the specific clauses relating to dangerous substances contained in this ETA, there may be other requirements applicable to the products falling within its scope (e.g. transposed European legislation and national laws, regulations and administrative provisions). In order to meet the provisions of the EU Construction Products Directive, these requirements need also to be complied with, when and where they apply.

3.5. ER. 6 Energy, economy and heat retention

Core thermal resistance

The core thermal resistance is determined according to the standard EN 16012:2015 (at a mean temperature of 10°C). The fractile core thermal resistance $R_{(10^\circ\text{C } 90/90)}$ representing at least 90% of the production with a confidence level of 90% has been calculated using the procedures as detailed in EN 16012:2015.

The fractile value of thermal resistance is $R_{(10^\circ\text{C}, 90/90)} = 0,29 \text{ m}^2.\text{K}/\text{W}$ representing at least 90 % of the production with a confidence level of 90%.

The declared thermal resistance R_D has been calculated by rounding $R_{(10^\circ\text{C } 90/90)}$ downwards to the nearest 0.05 m²K/W according to EAD 040007-00-1201 : December 2015 (§2.2.9).

The declared value of thermal resistance is $R_D = 0,25 \text{ m}^2.\text{K}/\text{W}$.

3.6. Emissivity

The emissivity is determined on the 2 external films of the product according to EN 16012:2015.

The fractile value of emissivity according to EN ISO 10456 is $\varepsilon_S = \varepsilon_{90/90} = 0,04$, representing at least 90 % of the production with a confidence level of 90%.

The declared value of emissivity for both faces is $\varepsilon_D = 0,05$

3.7. Durability aspects

Corrosion test :

The test is carried out according to ISO 9227:1991, T3 : "Corrosion tests in artificial atmospheres – Salt spray tests". In order to check the behaviour of coatings of product with respect to corrosion.

The test results concerning the measure of loss of mass and the visual check of the state of surface of the product show that there is no sensitive loss of material.

3.8. Peel strength

The test is carried out according to EN ISO 11339:

- before ageing, average of peel strength resistance: $F_p = 0,5 \text{ kN}/\text{m}$,
- after ageing, average of peel strength resistance: $F_p = 0,5 \text{ kN}/\text{m}$.

The tolerance on the values measured is $\pm 20 \%$.

3.9. Tensile strength

The measurement of tensile strength parallel to product surface is carried out according to EN 1608.

The value of the tensile strength is the maximal of the strength σ_t applied in two cases :

- With the product alone :
 - o before ageing : $\sigma_t = 500$ kPa,
 - o after ageing : $\sigma_t = 479$ kPa.
- With the product assembled using the adhesive tape :
 - o before ageing : $\sigma_t = 174$ kPa,
 - o after ageing : $\sigma_t = 212$ kPa.

The tolerance on the values measured is ± 20 %.

3.10. Resistance to tearing

The measurement of resistance to tearing is carried out according to the EN 12310-1 before and after ageing during 28 days: 70 ° C / 90% HR.

- before ageing : $\sigma_t = 144$ N,
- after ageing : $\sigma_t = 140$ N,

The tolerance on the values measured is ± 20 %.

3.11. Sustainable use of natural resources (BWR7)

For the sustainable use of natural resources, no performance was investigated for this product.

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

In accordance with the European Assessment Document EAD 040007-00-1201, the applicable European legal act is : 1999/91/EC.

The system to be applied is : 3

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

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited with CSTB.

The original French version is signed By

Charles BALOCHE
Technical Director – CSTB