

European Technical Assessment

**ETA-18/0357
of 22/04/2018**

English translation prepared by CSTB - Original version in French language

General Part

Nom commercial
Trade name

HYBRIS, ALVEOL'R, THERMO AIR

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

**ACTIS SA
Avenue de Catalogne
11300 Limoux, France**

Usine de fabrication
Manufacturing plant

**ACTIS SA
Avenue de Catalogne
11300 Limoux, France**

Cette évaluation contient:
This Assessment contains

10 pages incluant 0 annexes qui font partie intégrante de cette
évaluation
*10 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 (DEE) (EAD-04007-00-1201)**

Cette évaluation remplace :
This Assessment replaces

ETA-13/0121

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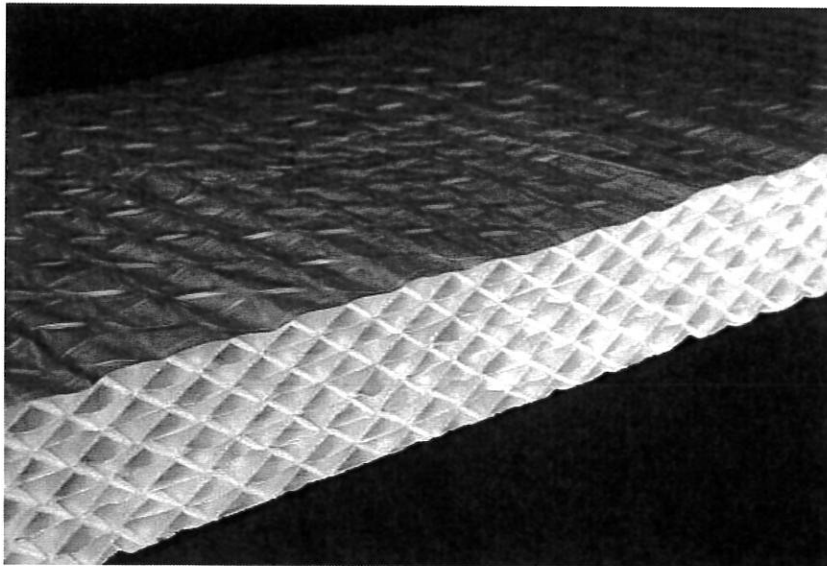
SPECIFIC PART

1. Technical: definition of the product and intended use

HYBRIS, ALVEOL'R, THERMO AIR is a non-homogeneous insulating product. It is composed of an inner core of shaped polyethylene foam layers with outer surfaces of aluminium coated polyethylene foils. The inner foam layers are interspersed with aluminium coated foils creating triangular shaped air cavities. The layers are assembled by thermo-glueing.

The thickness of the product varies from 40 to 205 mm. The product is packaged in rolls or panels.

An PE silicone adhesive tape 100 mm wide with acrylate glue is used to seal joints between HYBRIS sheets.



Hybris product

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

HYBRIS, ALVEOL'R, THERMO AIR is intended to be used in construction system as thermal insulation in roofs, walls and floors:

Application for roofs

- Pitched roof at rafter level
- Loft/attics application
- Suspended and exposed timber floors
- Cold flat roofs (as used e.g. in the United Kingdom)

Application for walls

- Vertical walls in timber frame constructions
- Vertical masonry walls
- Vertical steel frame construction

The HYBRIS, ALVEOL'R, THERMO AIR shall be used in watertight and weatherproof constructions and the surfaces to be covered shall be firmly fixed, clean, dry and smooth. Storing loads on the HYBRIS is not allowed.

Air gaps on the external surfaces can be installed to make use of the reflective faces of HYBRIS and thereby improving the thermal efficiency of the construction.

Concerning the application of the thermal insulation products also the respective national regulations shall be observed.

The design value of the thermal conductivity or thermal resistance 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 the standard EN 822.

Table 1a: Length and width of HYBRIS, ALVEOL'R, THERMO Insulation -

	Length x width
<i>HYBRIS, ALVEOL'R, THERMO AIR Insulation – Rolls</i>	<i>width: 1200 m Length: depending on thickness: 3,2 m to 8 m.</i>
<i>HYBRIS, ALVEOL'R, THERMO AIR Insulation – Panels</i>	<i>2650 m x 1150 m (*)</i>

(*) Complementary dimensions can be proposed depending to the application:
(such as: 1325 x 1150, 1200 x 1150, 610 x 1200, 410 x 1200, 1200x1145).
The other technical characteristics remaining identical.

Deviation :

The deviation from the nominal length is not more than - 2% +5%.

The deviation from the nominal width does not exceed the value $\pm 2\%$. The deviation from nominal thickness is not more than $-2 / + 10$ mm

Thickness

The thickness of the product is determined according to the standard EN 823. The test is performed with a load of 25Pa.

Table 1b: thickness of HYBRIS, ALVEOL'R, THERMO AIR Insulation

Thickness of HYBRIS, ALVEOL'R, THERMO AIR Insulation (mm)	
<i>Rolls</i>	<i>Panels</i>
	40
45	50
60	60
75	75
90	90
105	105
120	120
135	125
150	140
	155
	170
	185
	195
	205

Deviation :

The deviation from the nominal thickness does not amount to be more than: $- 2/+ 10$ mm

3.2. Mass per square meter

The mass per square meter is determined according to the standard EN 1602.

Table 2: Mass per unit area of HYBRIS Insulation – Rolls

Thickness (mm)	Net Weight (kg)	Area (m ²) / roll	Weight/area (kg/m ²)
45	4,89	9,6	0,51
60	4,74	7,44	0,64
75	5,13	6,72	0,76
90	5,24	5,88	0,89
105	5,25	5,16	1,02
120	5,5	4,32	1,27
135	5,71	4,08	1,40
150	5,87	3,84	1,53

Table 3: Mass per unit area of HYBRIS Insulation – Panels

Thickness (mm)	Weight (kg)	Area (m ²)/package	Weight/area (kg/m ²)
40	9,3	24,38	0,382
50	5,8	12,19	0,475
60	10,4	18,29	0,568
75	8,7	12,19	0,713
90	10,4	12,19	0,853
105	12,2	12,19	1,000
120	6,55	6,09	1,075
125	7,2	6,09	1,182
140	8,1	6,09	1,33
155	9	6,09	1,477
170	9,8	6,09	1,609
185	10,7	6,09	1,757
195	11,3	6,09	1,855
205	11,9	6,09	1,954

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.

Fire class of product: class F

3.4. ER.3 Hygiene, health and environment

Resistance to water vapour

The water vapour diffusion resistance μ is determined according to the standard EN 12572, condition C (23°C, 50%/93% R.H.). The thickness of equivalent layer of air having an equivalent vapour diffusion resistance S_d is higher than 90 m.

VOC (volatile organic compounds)

The VOC emissions of HYBRIS, ALVEOL'R, THERMO AIR have been determined according to ISO 16000 parts -3, -6, -9, -11. The results are shown in the table 4 below.

Table 4 : VOC (volatile organic compounds)

	Concentration after 28 days µg/m ³
TVOC	<2
Formaldehyde	<4
Acetaldehyde	<4
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°C 90/90) representing at least 90% of the production with a confidence level of 90% has been calculated according EN 16012:2015. The declared thermal resistance RD has been calculated by rounding R(10°C 90/90) downwards to the nearest 0.05 m²K/W according to EAD 040007-00-1201 : December 2015 (§2.2.9).

Table 5. Core thermal resistances – Panels and Rolls

Thickness [mm]	Declared core thermal resistance [m².K/W]	Panels	Rolls
40	1,20	X	
45	1,35		X
50	1,50	X	
60	1,80	X	X
75	2,25	X	X
90	2,70	X	X
105	3,15	X	X
120	3,60	X	X
125	3,75	X	
135	4,05		X
140	4,20	X	
150	4,50		X
155	4,65	X	
170	5,15	X	
185	5,60	X	
195	5,90	X	
205	6,20	X	

- **Thermal resistance of HYBRIS, ALVEOL'R, THERMO AIR with air gaps**

According to EN16012, HYBRIS, ALVEOL'R, THERMO AIR thermal resistance with air gaps can be determined by adding thermal resistance of the air gaps neighbouring product.

The thermal resistance of air gaps has been calculated for air gaps of 20mm, horizontal heat flow and room temperature of 20°C and external temperature of 0°C (table 2)

Table 6a. Thermal resistances of the HYBRIS, ALVEOL'R, THERMO AIR – with 1 or 2 air gaps -Panels

Thickness (mm)	Thermal Resistance with 1 and 2 air gaps in horizontal heat flow (m ² .K/W)		
	Core	Core + 1 air gap*	Core + 2 air gaps*
40	1,20	1,80	2,40
50	1,50	2,10	2,70
60	1,80	2,40	3,00
75	2,25	2,85	3,45
90	2,70	3,30	3,90
105	3,15	3,75	4,35
120	3,60	4,20	4,80
125	3,75	4,35	4,95
140	4,20	4,80	5,40
155	4,65	5,25	5,85
170	5,15	5,75	6,35
185	5,60	6,20	6,80
195	5,90	6,50	7,10
205	6,20	6,80	7,40

Table 6b. Thermal resistances of the HYBRIS, ALVEOL'R, THERMO AIR – with 1 or 2 air gaps - Rolls

Thickness (mm)	Thermal Resistance with 1 and 2 air gaps in horizontal heat flow (m ² .K/W)		
	Core	Core + 1 air gap*	Core + 2 air gaps*
45	1,35	1,95	2,55
60	1,80	2,40	3,00
75	2,25	2,85	3,45
90	2,70	3,30	3,90
105	3,15	3,75	4,35
120	3,60	4,20	4,80
125	3,75	4,35	4,95
135	4,05	4,65	5,25
150	4,50	5,10	5,70

(*) Air gaps of 20mm, horizontal heat flow and room temperature of 20°C and external temperature of 0°C

Note: Other calculations for other configurations such as upwards and downwards heat flow can be made according to EN 6946.

3.6. Emissivity

The emissivity is determined on the 2 metalized external films of the HYBRIS, ALVEOL'R, THERMO AIR according to EN 16012:2015.

- For metallized external film of product who is installed inside the building (warm side):
 - The emissivity of the inner metalized face after the ageing test is 0.035.
 - The fractile value of emissivity is 0.043, representing at least 90% of the production with a confidence level of 90%.
 - The declared value of emissivity is **0.06**.

- For the other metallized external film:
 - The emissivity of the outer face after the ageing test is 0.0927.
 - The fractile value of emissivity is 0.0997, representing at least 90% of the production with a confidence level of 90%.
 - The declared value of emissivity is **0.10**.

3.7. Durability aspects

Corrosion resistance:

Test according to ISO 9227, T3: "Corrosion tests in artificial atmospheres – Salt spray tests".

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 peel strength of the adhesive tape on the external outer film of the product is tested according to the standard EN ISO 11339, before and after ageing 28 days at + 70°C/90 % RH.

PRODUCT	Before ageing (N/100 mm)	After ageing (N/100 mm)
Adhesive tape	22*	98**

*Mean value

**HYBRIS panel surface is torn around the tape before the adhesive glue starts to peeling.

3.9. Tensile strength

PRODUCT	Before ageing		After ageing (kPa)	
	Longitudinal direction	Transverse direction	Longitudinal direction	Transverse direction
HYBRIS (product alone)	65.0 kPa	47.9 kPa	74.0 kPa	52.3 kPa
HYBRIS assembled using the adhesive tape	116 N/100 mm		132 N/100 mm	

The tensile strength parallel to faces is determined according to the standard EN 1608, before and after ageing 28 days at + 70 °C/ 90 % RH.

3.10. Resistance to tearing

The resistance to tearing is determined according to the standard EN 12310-1 part 1, before and after ageing 28 days at + 70°C/90 % RH.

The tearing resistance to longitudinal direction is 190 N before ageing and 199 N after ageing. The tearing resistance to transverse direction is 180 N before ageing and 188 N after ageing.

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