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European Technical Assessment

**ETA 18/0166
of 25/03/2018**

I General Part

**Technical Assessment Body
issuing the European Technical
Assessment:**

Technical and Test Institute for Construction Prague

**Trade name of the construction
product:**

Thin metal composite sheet **ALUBOND U.S.A FR B**

**Product family to which the
construction product belongs**

Product area code: 21 Internal and external wall and ceiling finishes, internal partition kits

Manufacturer

ALUBOND EUROPE d.o.o.
Nemanjina 130, 26320 Banatski Karlovec
Serbia
www.alubondeurope.com

Manufacturing plant(s)

ALUBOND EUROPE d.o.o.
Nemanjina 130, 26320 Banatski Karlovec
Serbia
www.alubondeurope.com

**This European Technical
Assessment contains**

9 pages including 1 Annex which form an integral part of this assessment.
Annex A contains confidential information and is/are not included in the European Technical Assessment when that assessment is publicly available.

**This European Technical
Assessment is issued in
accordance with Regulation (EU)
No. 305/2011, on the basis of**

EAD 210046-00-1201
Thin Metal Composite Sheet

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 (excepted the confidential Annex(es) referred to above). However, partial reproduction may be made, with the written consent of the issuing Technical Assessment Body - Technical and Test Institute for Construction Prague. Any partial reproduction has to be identified as such.

1. Technical description of the product

1.1 Definition of products

The subject of this European Technical Assessment (ETA) are thin metal composite sheets (TMCS). TMCS consists of two thin layers of metallic skin, which are sandwiching a core in a continuous co-extrusion process. External face of metallic skin can be pre-coated or not. The joining of metallic skins with core is achieved by adhesive which is applied to the core and which is then faced with the top and bottom coated metallic sheets. The bond is formed by temperature and pressure under controlled conditions. The product is subsequently cut to a range of panel sizes.

TMCS is composed by:

- Faced skins made of aluminium alloy sheets according to EN 485-2 or EN 485-4 with nominal thickness of external/internal sheet (faced skins) 0,5 mm (to the thickness tolerance quote in EN 485-4). The sheets are coated on the top surface with primer, PVDF, HDPE or Anodized topcoat giving a total coating thickness of 25 µm. The reverse side is coated with a 5 µm thick polyethylene resin.
- Solid core is fire-rated core made mainly of flame retardant minerals with low density polyethylene.
- Adhesive layer of bonding faced skins and core through a continuous industrial process.

Table 1.1: Nominal dimensions of TMCSs

Dimensions of TMCS [mm]	
Overall nominal thickness	4 *
Material and thickness of skin	Aluminium, 0,5 mm both skins
Width	1250, 1500 **
Length	up to 6000 ***

* Overall nominal thickness of 3, 5 and 6 mm are not covered by the scope of this ETA.

** Other widths from 900 mm to 1590 mm are available on special order.

*** Lengths of up to 9000 mm are available on special order.

Composition of TMCS

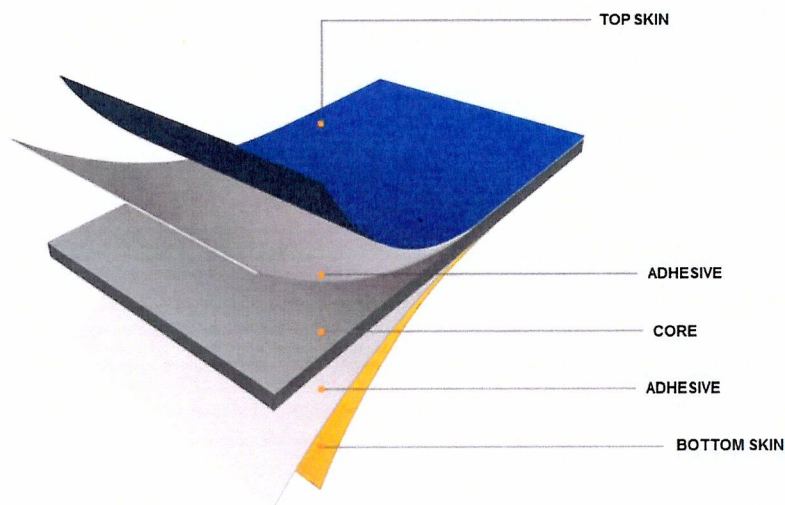


Figure 1: TMCS

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

2.1 Intended use

The product (TMCS) is intended to be used for manufacturing of:

- Cladding elements (cassettes/coffering, panels) in external and internal wall cladding kits
- Parts (filling elements) of partition kits
- Filling elements in external or internal supported ceilings
- Rail filling
- Substrate boards for information and orientation systems.

The provisions made in this European Technical Assessment are based on an assumed working life of 25 years as minimum, provided that the TMCSs are subject to appropriate use and maintenance.

The indications given on the working life cannot be interpreted as a guarantee given by the manufacturer or Assessment Body, 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.

2.2 Manufacturing

The European Technical Assessment is issued for the TMCSs on the basis of agreed data/information, deposited with the Technical and Test Institute for Construction Prague, which identifies the product that has been assessed and judged. Changes to the product or production process, which could result in this deposited data/information being incorrect, shall be notified to the Technical and Test Institute for Construction Prague before the changes are introduced. The Technical and Test Institute for Construction Prague will decide whether or not such changes affect the ETA and consequently the validity of the CE marking on the basis of the ETA and if so whether further assessment or alterations to the ETA, shall be necessary.

2.3 Design and installation

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.

2.4 Packaging, transport and storage

The information on packaging, transport and storage is given in the manufacturer's technical documentation. It is the responsibility of the manufacturer(s) to ensure that this information is made know to the concerned people.

2.5 Use, maintenance and repair

The maintenance of TMCSs includes inspections on site, taking into account the following aspects:

- Regarding the TMCSs: Appearance of any damage such as cracking, delamination or detachment due to permanent and irreversible deformation
- Regarding metallic components: Presence of corrosion or water accumulation
- Necessary repairs should be done rapidly, using the same kit components and following the repair instructions given by ETA holder

The information on use, maintenance and repair is given in the manufacturer's technical documentation. It is the responsibility of the manufacturer(s) to ensure that this information is made know to the concerned people.

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

Basic Works Requirement 2: Safety in case of fire

Tab. 3.1 Reaction to fire

EAD 210046-00-1201, Cl. 2.2.1

Thickness: nominal / skin / skin material	Performance	Class
4 / 0,5 / 0,5 / AI	Reaction to fire	B-s1, d0

Basic Works Requirement 4: Safety and accessibility in use

Tab. 3.2 Tensile performance – core included

EAD 210046-00-1201, Cl. 2.2.2

Thickness: nominal / skin / skin material	Performance		Average value	Standard deviation σ_n	Characteristic value		Confidence interval	
4 / 0,5 / 0,5 / AI	Tensile strength $\sigma_{t,cplx}$	[MPa]	46,3	0,31	$\sigma_{t,cplx,k}$	46	--	
	Yield strength $\sigma_{m,cplx}$	[MPa]	41,1	0,34	$\sigma_{m,cplx,k}$	41	--	
	Elongation ϵ_{cplx}	[%]	8,9	0,71	--	--	$\epsilon_{cplx,0,975}$	8,1 – 9,6
	Tensile modulus of elasticity $E_{t,cplx}$	[GPa]	17,4	0,37	--	--	$E_{t,cplx,0,95}$	17

Tab. 3.3 Tensile performance – without core

EAD 210046-00-1201, Cl. 2.2.2

Thickness: nominal / skin / skin material	Performance		Average value	Standard deviation σ_n	Characteristic value		Confidence interval	
4 / 0,5 / 0,5 / AI	Tensile strength $\sigma_{t,sans}$	[MPa]	164,4	2,71	$\sigma_{t,sans,k}$	159	--	
	Yield strength $\sigma_{m,sans}$	[MPa]	158,6	1,87	$\sigma_{m,sans,k}$	159	--	
	Elongation ϵ_{sans}	[%]	1,3	0,12	--	--	$\epsilon_{sans,0,975}$	1,2 – 1,4

Tab. 3.4 Tensile strength perpendicular to face

EAD 210046-00-1201, Cl. 2.2.3

Thickness: nominal / skin / skin material	Performance	Average value	Standard deviation σ_n	Characteristic value $\sigma_{mt,k}$	
4 / 0,5 / 0,5 / AI	Tensile strength perpendicular to face σ_{mt}	[MPa]	4,69	0,21	4,2

Tab. 3.5 Flexural performance

EAD 210046-00-1201, Cl. 2.2.4

Thickness: nominal / skin / skin material	Performance		Average value	Standard deviation	Characteristic value		Confidence interval	
Four-point test arrangement				σ_n				
4 / 0,5 / 0,5 / AI	Bending strength $R_{bend,INI}$	[MPa]	123,2	0,83	$R_{bend,k}$	121	--	
	Bending modulus of elasticity E_{bend}	[GPa]	48,6	0,47	--	--	$E_{bend,0,95}$	48

Thickness: nominal / skin / skin material	Performance		Average value	Standard deviation	Characteristic value		Confidence interval
Three-point test arrangement				σ_n			
4 / 0,5 / 0,5 / AI	Flexural strength $R_{flex,INI}$	[MPa]	117,7	0,30	$R_{flex,k}$	118	--

Tab. 3.6 Shear performance

EAD 210046-00-1201, Cl. 2.2.5

Thickness: nominal / skin / skin material	Performance		Average value	Standard deviation σ_n	Characteristic value		Confidence interval	
4 / 0,5 / 0,5 / AI	Shear strength σ_s	[MPa]	4,5	0,22	$\sigma_{s,k}$	4,0	--	
	Shear modulus of elasticity G	[MPa]	37,6	2,96	--		$G_{0,95}$	35

Tab. 3.7 Thickness

EAD 210046-00-1201, Cl. 2.2.6

Thickness: nominal / skin / skin material	Performance		Median	Confidence interval $d_{0,975}$
4 / 0,5 / 0,5 / AI	Total thickness d	[mm]	4,0	4,0 – 4,0
	Top skin d_{top}		0,49	0,48 – 0,49
	Bottom skin d_{bot}		0,49	0,48 – 0,49

Tab. 3.8 Apparent area density

EAD 210046-00-1201, Cl. 2.2.7

Thickness: nominal / skin / skin material	Performance		Median	Confidence interval $g_{0,975}$
4 / 0,5 / 0,5 / AI	Apparent area density g	[kg/m ²]	7,0	7,0 – 7,0

Tab. 3.9 Torque peel strength

EAD 210046-00-1201, Cl. 2.2.8

Thickness: nominal / skin / skin material	Performance		Average value	Standard deviation σ_n	Confidence interval $T_{INI,0,975}$
4 / 0,5 / 0,5 / AI	Torque peel strength T_{INI}	[N.m/m]	106,0	4,75	100 - 112

Tab. 3.10 Hard body impact resistance

EAD 210046-00-1201, Cl. 2.2.9

Thickness: nominal / skin / skin material	Performance			Level
4 / 0,5 / 0,5 / AI	Hard body impact resistance	$E_{23^\circ C/55\%}$	[N*m]	10
		$E_{-20^\circ C}$		10

Basic Works Requirement 5: Protection against noise

Tab. 3.11 Dynamic stiffness

EAD 210046-00-1201, Cl. 2.2.10

Thickness: nominal / skin / skin material	Performance		Level
4 / 0,5 / 0,5 / AI	Dynamic stiffness s'	[MPa/m]	22,9

Basic Works Requirement 6: Energy economy and heat retention

Tab. 3.12 Coefficient of thermal conductivity

EAD 210046-00-1201, Cl. 2.2.11

Thickness: nominal / skin / skin material	Performance		Level
4 / 0,5 / 0,5 / AI	Coefficient of thermal conductivity λ	[W/(m.K)]	NPA

Basic Works Requirement 7: Sustainable use of natural resources

Tab. 3.13 Relative change of torque peel strength after conditioning

EAD 210046-00-1201, Cl. 2.2.12.1 to 2.2.2.12.5

Thickness: nominal / skin / skin material	Torque peel strength	In initial state	After hydrothermal cycles	After immersion for 6 hours in boiling water at 90 °C	After immersion for 500 hours in water at 20 °C	After freeze-thaw cycles	After long term exposure to heat
	[N.m/m]	T_{INI}	T_h	$T_{i,6h,90^\circ C}$	$T_{i,500h,20^\circ C}$	T_{ft}	$T_{lt,80^\circ C}$
4 / 0,5 / 0,5 / AI	Average value	106,0	99,5	106,1	102,6	104,2	101,3
	Relative change ΔT	--	94 %	100 %	97 %	98 %	96 %
	Description of defects	--	Without defects	Without defects	Without defects	Without defects	Without defects

Tab. 3.14 Relative change of bond strength in four-point test arrangement after conditioning

EAD 210046-00-1201, Cl. 2.2.12.1 to 2.2.2.12.5

Thickness: nominal / skin / skin material	Bond strength in four-point test arrangement	In initial state	After hydrothermal cycles	After immersion for 6 hours in boiling water at 90 °C	After immersion for 500 hours in water at 20 °C	After freeze-thaw cycles	After long term exposure to heat
	[MPa]	$R_{bend,INI}$	R_h	$R_{i,6h,90^\circ C}$	$R_{i,500h,20^\circ C}$	R_{ft}	$R_{lt,80^\circ C}$
4 / 0,5 / 0,5 / AI	Average value	123,2	NPA				
	Relative change ΔR	--	NPA				
	Description of defects	--	NPA				

Tab. 3.15 Relative change of bond strength in four-point test arrangement after conditioning

EAD 210046-00-1201, Cl. 2.2.12.6

Thickness: nominal / skin / skin material	Performance		Level		
			1	2	3
4 / 0,5 / 0,5 / AI	Creep coefficient ϕ_t	[-]	NPA		

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

For the products covered by this ETA with regard to intended use as internal and external wall and ceiling finishes the applicable European legal act is Decision 1998/437/EC as amended by 2001/596/EC.

The system is: **3**

In addition, with regard to reaction to fire for products covered by this ETA the applicable European legal act is Decision 1998/437/EC as amended by 2001/596/EC.

The systems are: **1, 3, 4**

For the products covered by this ETA with regard to their intended use for manufacturing of elements for kits for exterior wall claddings the applicable European legal act is Decision 2003/640/EC.

The system is: **2+**

In addition, with regard to reaction to fire for products covered by this ETA the applicable European legal act is Decision 2003/640/EC.

The systems are: **1, 3, 4**

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

In order to help the Notified Body to make an evaluation of conformity, the Technical Assessment Body issuing the ETA shall supply the information detailed below. This information together with the requirements given in EC Guidance Paper B will generally form the basis on which the factory production control (FPC) is assessed by the Notified Body.

This information shall initially be prepared or collected by the Technical Assessment Body and shall be agreed with the manufacturer. The following gives guidance on the type of information required:

- The ETA
Where confidentiality of information is required, this ETA makes reference to the manufacturer's technical documentation which contains such information.
- Basic manufacturing process
The basic manufacturing process is described in sufficient detail to support the proposed FPC methods.
The FPSs are generally manufactured using conventional techniques. Any critical process or treatment of the components which affects performance are highlighted in the manufacturer's documentation.
- Product and materials specifications
The manufacturer's documentation includes:
 - detailed drawings (possibly including manufacturing tolerances),
 - incoming (raw) materials specifications and declarations,
 - references to European and/or international standards,
 - technical data sheets.

- Control Plan (as a part of FPC)

The manufacturer and the Technical and Test Institute for Construction Prague have agreed a Control Plan (is specified in Cl. 3.2 of EAD 210046-00-1201) which is deposited with the Technical and Test Institute for Construction in documentation which accompanies the ETA. The Control Plan specifies the type and frequency of checks/tests conducted during production and on the final product. This includes the checks conducted during manufacture on properties that cannot be inspected at a later stage and for checks on the final product.

Products not manufactured by the TMCSs manufacturer shall also be tested according to the Control Plan. It must be demonstrated to the Notified Body that the FPC system contains elements securing that the TMCSs manufacturer takes products conforming to the Control Plan from his supplier(s).

Where materials/components are not manufactured and tested by the supplier in accordance with agreed methods, then where appropriate they shall be subject to suitable checks/tests by the TMCSs manufacturer before acceptance.

In cases where the provisions of the European Technical Assessment and its Control Plan are no longer fulfilled, the Notified Body shall withdraw the certificate and inform Technical and Test Institute for Construction Prague without delay.

Issued in Prague on 25.03.2018



By
Ing. Maria Schaan

Head of the Technical Assessment Body

Annex A: Quality control of components of kits manufactured by suppliers or holder

This confidential information is not included in the ETA when that assessment is publicly available.