

# ALUCOBOND®

## TRANSPORT & INDUSTRY

All you need to know about the original aluminium composite panel

English



# ALUCOBOND® FOR TRANSPORT AND INDUSTRY

The enormous success of ALUCOBOND® is based on its excellent product qualities such as exceptional top-grade flatness and rigidity, low weight, excellent formability, weather resistance, simple fabrication and ease of cleaning. In addition, a large choice of colours and a wide variety of designs offer architects and designers unlimited possibilities for creative, innovative and customised planning. ALUCOBOND® is available in a large range of formats including a flame-retardant or non-combustible core. Due to its simple processing techniques and fire retardant core options,

the possibilities for implementing ALUCOBOND® for interior and exterior applications are manifold. ALUCOBOND® is used in architectural applications, vehicle engineering, shipbuilding, rail way engineering and other industrial applications such as machine claddings, cleanroom technology and lift construction.

In the future, ALUCOBOND® will continue to focus strongly on innovation. With new products and surfaces, we will offer new possibilities and solutions to the world.

## ALUCOBOND®

ALUCOBOND® is a rigid, yet flexible façade material for architectural uses. It is now also well-established in many other areas of industrial applications. ALUCOBOND® is extremely weatherproof, impact-resistant and break-proof, vibration-damping, and ensures easy and fast installation. ALUCOBOND® is produced with various core thicknesses in a continuous lamination process and then customized regarding dimensions.

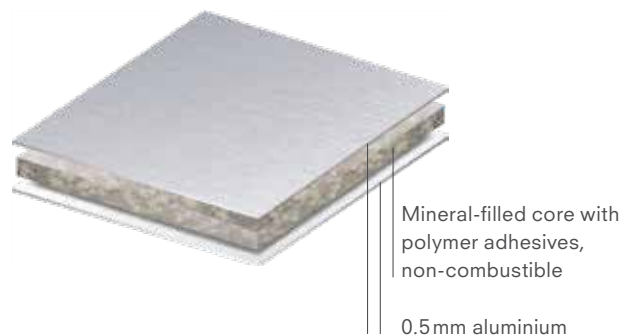
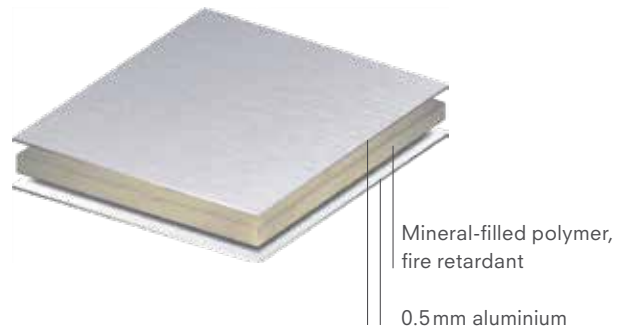
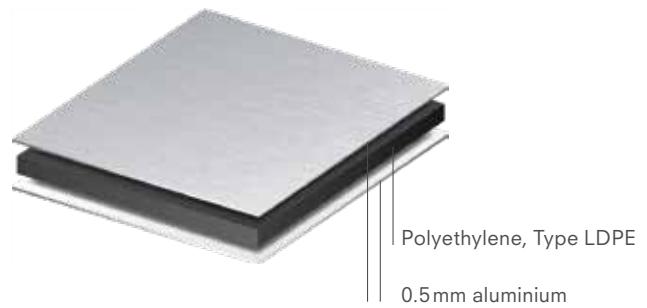
## ALUCOBOND® PLUS

ALUCOBOND® PLUS has been developed exclusively for the more stringent requirements of the fire prevention regulations. Thanks to its mineral-filled, core ALUCOBOND® PLUS meets the stricter requirements of the fire classifications. It is hardly inflammable and offers all the proven product properties of the ALUCOBOND® family, such as flatness, formability, resistance to weather and easy processing.

## ALUCOBOND® A2

ALUCOBOND® A2 is the only non-combustible aluminium composite panel that fulfills the respective standards worldwide. Thanks to its mineral-filled core, ALUCOBOND® A2 meets the strict requirements of the fire regulations and enhances the possibilities for concept and design. ALUCOBOND® A2, just like all the products of the ALUCOBOND® family, allows simple processing, is impact-resistant, break-proof and weatherproof and, above all, non-combustible.

## THE PRODUCT



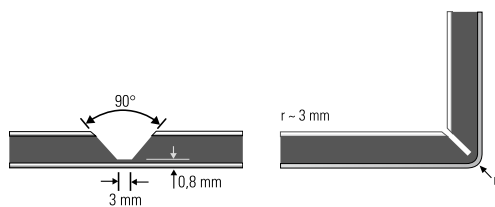
# TECHNICAL DATA

Technical data	ALUCOBOND®						ALUCOBOND® PLUS			ALUCOBOND® A2	
	Standard	Unit	3mm	4mm	6mm	3mm	4mm	6mm	3mm	4mm	
Thickness											
Cover sheet thickness	t		mm			0.5					
Weight	G		kg/m <sup>2</sup>			4.5 5.5 7.3			5.9 7.6 10.8		
<b>Technological values</b>											
Section modulus	W	DIN 53293	cm <sup>3</sup> /m	1.25	1.75	2.75	1.25	1.75	2.75	1.25	1.75
Rigidity	E·J	DIN 53293	kNcm <sup>2</sup> /m	1250	2400	5900	1250	2400	5900	1250	2400
Alloy		EN 573-3		EN AW 5005A (AIMg1)							
Temper of cover sheets		EN 515		H22/H42							
Modulus of elasticity	E	EN 1999 1-1	N/mm <sup>2</sup>	70000							
Tensile strength of cover sheets	R <sub>m</sub>	EN 485-2	N/mm <sup>2</sup>	≥ 130							
Proof stress (0.2%)	R <sub>p0.2</sub>	EN 485-2	N/mm <sup>2</sup>	≥ 90							
Elongation	A <sub>90</sub>	EN 485-2	%	≥ 5							
Linear thermal expansion	α <sub>t</sub>	EN 1999 1-1		2.4mm/m with 100°C difference in temperature							
<b>Acoustical properties</b>											
Sound absorption factor	α <sub>s</sub>	ISO 354		0.05							
Sound transmission loss	R <sub>w</sub>	ISO 717-1	dB	≥ 25							
Loss factor	d	EN ISO 6721		0.0072	0.0087	0.0138	--	--	--	0.004	0.005
<b>Thermal properties</b>											
Thermal resistance	R	DIN 52612	m <sup>2</sup> K / W	0.007	0.0103	0.0172	0.007	0.009	0.0152	0.002	0.002
Thermal conductivity	λ	DIN 4108	W/m K	0.43	0.39	0.35	0.49	0.44	0.40	1.99	1.77
Heat transition coefficient	U	DIN 4108	W/m <sup>2</sup> K	5.65	5.54	5.34	5.68	5.58	5.40	5.83	5.80
Temperature resistance			°C	-50 to + 80							

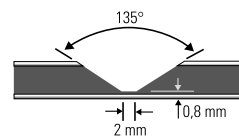
## ROUTING & FOLDING

Thanks to this very simple processing method ALUCOBOND® composite panels can be folded manually, following exactly the line of the routed groove. To do so, grooves are routed on the reverse side of the ALUCOBOND® panel. The shape of the groove determines the bending radius. The routing can be

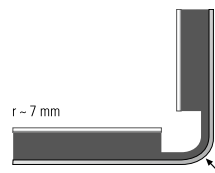
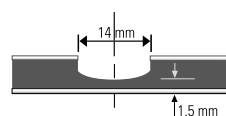
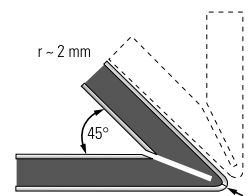
done using a vertical panel saw equipped with ALUCOBOND® grooving accessories, a CNC machining centre, a portable sheet milling machine or a hand router. The routing and folding method can be used for ALUCOBOND® composite panels with all available standard surface finishes.



90° V-groove for folds up to 90°



135° V-groove for folds up to 135°



Rectangular milled groove for bends of up to 150° depending on panel thickness.

# RAIL AND TRANSPORT VEHICLE CONSTRUCTION



Light weight – rail vehicle interior fitting possible with ALUCOBOND®

Today's strict economic and ecological conditions demand the implementation of sustainable structural materials in the field of transport that are lightweight, stable and fully recyclable.

In rail and transport vehicle construction, particularly the light weight and the high rigidity speak in favour of using ALUCOBOND®. Due to the lightweight construction, the CO<sub>2</sub> emission can be reduced and at the same time, there is less burden on the congested and restricted rail and road networks. ALUCOBOND® is recyclable, i.e. the panels are fed back into the material cycle and used for producing new material.

ALUCOBOND® composite panels are ideal for special interior fittings, such as wall and ceiling cladding in rail vehicle construction, for lorry superstructures, for cabins, doors and flap systems.

# SHIPBUILDING



Economic – marine interior fittings made with ALUCOBOND®

ALUCOBOND® plays an important role due to fire-protection standards and the necessary weight reduction in the shipbuilding industry.

Thanks to its very light weight combined with its economic workability, the composite panel is used – particularly in the interior of the ship – for the ceilings, walls or furniture and in the outer area for balcony partitioning. There are two material options available: fire retardant or non-combustible.

# MACHINE CASING



Stable – machine casing made of ALUCOBOND®

Unique mechanical properties in conjunction with excellent processing features mean ALUCOBOND® is the material of choice for machine casing.

It is suited for both interior and exterior applications due to its flexible yet robust nature. The range of widely differing and striking surfaces reflects the scope of potential applications.

# INTERIOR CONSTRUCTION



Individual – interior construction using ALUCOBOND®

Whether for cleanrooms, partitions, lightweight containers, cabins for machine tools, wind tunnels, lifting platforms, lifts, furniture etc., ALUCOBOND® is the ideal material for industrial applications.

For instance, individual interior design in stairways and public areas can be created by using large-format ALUCOBOND® panel cladding. These composite panels are also an excellent substrate for HPL, veneers, foils or paint.

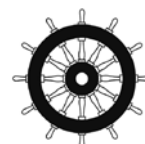
Simple processing using commercially available tools on site and the possibility of a flexible adaptation of the modular dimension and fixation method offer the construction workers the greatest possible comfort.

## APPROVALS AND FIRE CLASSIFICATION

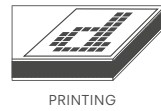
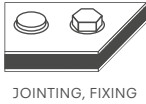
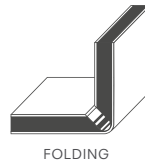
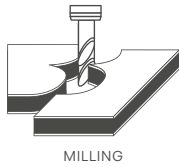
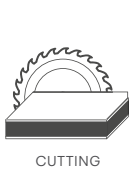
ALUCOBOND®			ALUCOBOND® PLUS		ALUCOBOND® A2	
Country	Tested according to...	Classification	Tested according to...	Classification	Tested according to...	Classification
EU	EN 13501-1	Class D	EN 13501-1	Class B-s1, d0	EN 13501-1	Class A2-s1, d0
Germany	DIN 4102-1 DIN 4102-7	Class B2 fulfilled	EN 1187 (Methode 1) / DIN 4102-7	fulfilled	EN 1187 (Methode1)/ DIN 4102-7	fulfilled
France	NF P 92-501 NF F 16-101	Class M1 Class F0	NF P 92-501	Class M1	NF P 92-501	Class M0, non-combustible
Italy	UNI 9177	Class 1				
Great Britain England / Wales / Scotland	BS 476-6/7 BS 476-6/7	Class 0 Class 0	BS 476-6/7 BS 476-6/7	Class 0 Class 0	BS 6853	meets requirements of LUL limited combustible non combustible
Scandinavia					DS 1065-1	Class A
Switzerland	VKF	Class 4.2	VKF	Class 5.3	VKF	Class 6q.3
Poland			PN-90/B-02867	NRO	EN 13501.1	Class A2-s1, d0
Russia	GOST 30244-94 GOST 30402-95 GOST 12.1.044-89 GOST 12.1.044-89	G4 (combustibility) W1 (flammability) D2 (smoke development) T2 (smoke flammability)	GOST 30244-94 GOST 30402-95 GOST 12.1.044-89 GOST 12.1.044-89 GOST 31251-03	G1 (combustibility) W1 (flammability) D2 (smoke development) T1 (smoke flammability) k0	GOST 30244-94 GOST 30402-95 GOST 12.1.044-89 GOST 12.1.044-89 GOST 31251-03	G1 (combustibility) W1 (flammability) D1 (smoke development) T1 (smoke flammability) k0
Australia	AS ISO 9705 AS 1530.3 Indices EN 13501.1	Group 3 material SMOGR 3.194 m2 / s2 0 (flammability) 0 (spread of flames) 0 (thermal development) 0 – 1 (smoke development) D	AS ISO 9705 AS 1530.3 Indices EN 13501.1	Group 1 material SMOGR 1.385 m2 / s2 0 (flammability) 0 (spread of flames) 0 (thermal development) 0 – 1 (smoke development) B-s1, d0	AS ISO 9705 AS 1530.3 Indices EN 13501.1	Group 1 material SMOGR 0.630 m2 / s2 0 (flammability) 0 (spread of flames) 0 (thermal development) 0 – 1 (smoke development) A2-s1, d0

ALUCOBOND®			ALUCOBOND® PLUS	
	Tested according to...	Classification	Tested according to...	Classification
Rail vehicles				
EU	EN 45545	HL1 (for R1)	EN 45545	HL1 up to HL3 (for R1, R7, R17)
Germany	DIN 5510 (DIN 54837)	S5 / SR2 / ST2		
Germany	DIN 5510 (DIN 53438)	K1		

ALUCOBOND® PLUS		
	Tested according to...	Classification
Shipbuilding		
EU US	MED approval (EC type approval certificate, steering wheel) US Coast Guard Approval	Modules B and D Flame-retardant surface materials and flooring with low flame-spread characteristics (veneers)



# PROCESSING



# USEFUL INFORMATION

## NATURALLY ALUCOBOND®

During the life cycle of ALUCOBOND® composite panels, no substances containing CFC are set free at any time. The core material does not contain any nitrogen, chlorine or sulphur. Therefore, selecting ALUCOBOND® for projects which require environmentally friendly materials is a natural choice.

## ENVIRONMENT, HEALTH AND SAFETY

For 3A Composites, effective, continuous environmental protection is a main priority. It is of utmost importance to preserve natural resources in order to ensure a livable tomorrow for future generations. It commits itself to continuous self-improvement programmes for environmental protection, many of which go above and beyond government regulations. It is also in this area that 3A Composites strives to be a leader in its field. We were one of the first companies to develop its own environmental management system, which is regularly audited by independent auditors. The successful certification according to EN ISO 14001 speaks for itself.

## SURFACES

ALUCOBOND® surfaces are coated using exclusively high-quality and eco-friendly lacquer systems. They are highly weather resistant and resistant to industrial emissions. These properties are achieved using UV-resistant bonding agents. For standard finishes, fluoropolymeric top coats (e.g. PVDF) are used. All surface coats are applied in a continuous coil-coating process, i.e. with a continuous coating and stove-lacquering procedure. The quality of the coating is tested according to standards established by E.C.C.A. (European Coil Coating Association).

## INSTALLATION

To avoid possible reflection differences (does not apply for solid colours), it is recommended to install the panels in the same direction as marked on the protective peel-off-foil. Colour variations may occur between panels originating from different production batches. To ensure colour consistency, the total requirement for a project should be placed in one order.

Make sure to remove the protective foil as soon as possible after installation as prolonged exposure to the elements could make the foil difficult to remove. When stacking the panels, nothing should be placed in between them, as this could produce marks on the panels. It is recommended to only stack pallets of identical size should, with a maximum of 6 pallets stacked on top of each other.



## RECYCLING

ALUCOBOND® can be fully recycled, i.e. both the core material and the aluminium cover sheets can be recycled and used for the production of new material.

## WARRANTY

ALUCOBOND® stands for high quality and longevity. Warranties according to the product specification and approved field of application can be obtained upon request.

# PRODUCT RANGE

## ALUCOBOND® / ALUCOBOND® PLUS

Thickness: 3/4 mm (6 mm on request)

Width [mm]	1000	1250	1500	1575	1750
Length [mm]	2000 – 6800	2000 – 6800	2000 – 6800	2000 – 6800	2000 – 6800
<b>Solid &amp; Metallic Colours</b>	●	●	●	●	○
<b>Spectra &amp; Sparkling Colours</b>	●	●	●	●	--
<b>Anodized Look</b>	●	●	●	○	○
<b>NaturAL</b>	--	●	○	--	--
<b>ALUCOBOND® Legno – premium wood</b>	○	●	●	--	--
<b>Vintage</b>	○	●	●	--	--
<b>Façade design – individual décor</b>	○	●	●	--	--
<b>Urban</b>	○	●	●	--	--
<b>Terra</b>	○	○	●	○	--
<b>Anodized*</b>	--	●	○	--	--
<b>Mill Finish</b>	●	●	●	--	--

## ALUCOBOND® A2

Thickness: 3/4 mm

Width [mm]	1000	1250	1500	1575	1650
Length [mm]	2000 – 6800	2000 – 6800	2000 – 6800	2000 – 6800	2000 – 6800
<b>Solid &amp; Metallic Colours</b>	--	●	●	--	○
<b>Spectra &amp; Sparkling Colours</b>	--	●	●	--	--
<b>Anodized Look</b>	--	●	●	--	○
<b>NaturAL**</b>	--	●	○	--	--
<b>ALUCOBOND® Legno – premium wood</b>	--	●	●	--	--
<b>Vintage</b>	--	●	●	--	--
<b>Façade design – individual décor</b>	--	●	●	--	--
<b>Urban</b>	--	●	●	--	--
<b>Terra</b>	--	○	○	--	--
<b>Mill Finish</b>	--	●	●	--	--

○ on request

\* Anodized according to DIN 17611. All anodized ALUCOBOND® composite panels have contact lines (about 25mm width) on their short sides. For panel lengths of more than 3500mm, the composite panels have contact lines (about 20 mm width) on their long sides. On the back, there are contact lines of about 35 mm on the short and the long sides of the panels. Maximum panel length 6500mm. Please take this into consideration when dimensioning the panels.

\*\* Exception: ALUCOBOND® naturAL Reflect is only available in ALUCOBOND® PLUS.

### DIMENSIONAL TOLERANCES (Standard)

Due to manufacturing, a displacement of the cover sheets sideways at the panel edges up to 2mm is possible.

Thickness: ± 0.2 mm (mill-finish | stove lacquered | anodized)

Width: - 0 / + 4 mm

Lengths: 2000 – 4000mm; - 0 / + 6 mm

Lengths: 4001 – 6800mm; - 0 / + 10 mm

### COLOURS AND SURFACES

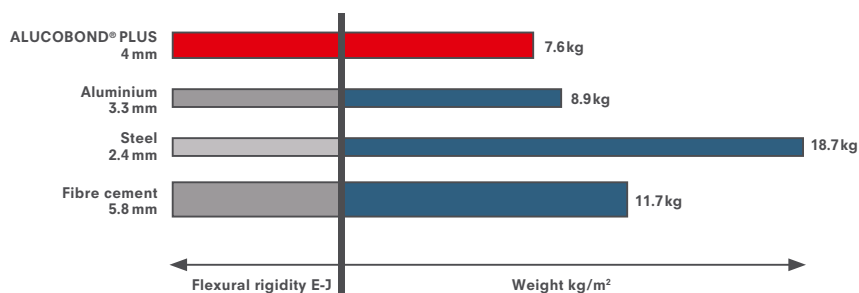
More colours and surfaces are available upon request.

They are subject to our minimum quantities.

## FLEXURAL RIGIDITY

Aluminium cover sheets and a mineral core ensure an impressive weight: flexural rigidity relation, even in terms of large panel sizes. Despite the easy and lightweight handling which this brings about when processing and assembling,

ALUCOBOND® consistently shows its strong side, due to its excellent flexural rigidity: the panel remains stable in terms of shape and flatness, even when there are extreme temperature fluctuations.



Comparison of thickness and weight with the same flexural rigidity

Boundless possibilities.  
**ALUCOBOND®**



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