

# ALUCOBOND®



Flying high

ALCAN COMPOSITES



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Founded in 1912, Alcan Singen GmbH is one of the leading aluminium processing companies in Germany. It is part of the international Alcan Group which has extensive production facilities in more than 50 countries with various distribution centres located around the world.

With its numerous product innovations and state-of-the-art production facilities, Alcan Singen has been a pioneer in processing of aluminium for more than 90 years. Already in 1969, the production of ALUCOBOND® started on a commercial basis. By the turn of the millennium, 70 million square meters of this light aluminium composite panel had been sold world-wide. For more than 35 years, building owners and architects have successfully chosen our versatile ALUCOBOND® as a construction material to turn their ideas into reality and to give buildings and skylines the shape of the future.



Ancient view of the former castle on top of the 686 m high extinct volcano, the Hohentwiel, near the town of Singen.

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# EVOLUTION



0.5 mm  
Aluminium

0.5 mm  
Aluminium

2-5 mm  
Plastic or  
mineral filled  
core

## The Product

ALUCOBOND® is a composite panel consisting of two aluminium cover sheets and a plastic or mineral filled core.

## ALUCOBOND® Production Sites

EUROPE  
Singen / Germany

NORTH AMERICA  
Benton / USA

SOUTH AMERICA  
Camacari / Brazil

ASIA / PACIFIC  
Shanghai / China



### **Comprehensive Service**

The service teams at ALCAN COMPOSITES support architects and building owners right from the planning stage. They provide comprehensive technical information and individual advisory services to assist in the perfect implementation of all ideas and plans. For every project, the proven strategy to achieve a smooth completion lies in an early co-ordination between vision, architectural plans and the many possibilities which our unique panels give to fabricators and installers. Our product and application know-how is the fastest and surest way to success, whether for new buildings, renovation works, interior or exterior applications.

### **Just-in-time Fabrication Centres**

During the past 30 years, qualified, independent fabricators and installers have become firmly established, offering professional service to the building industry. They have acquired deep

knowledge in the processing of ALUCOBOND® and their skilled personnel and specialized processing equipment ensure that your project is completed on time and within budget.

### **Worldwide**

The close co-operation between ALCAN COMPOSITES and its distributors has led to a finely meshed international marketing network that provides



our customers with distinct benefits. Wherever a project is to be realized, ALCAN COMPOSITES and its partners ensure you quick and professional on-site service.

### **One thousand ideas - one material**

The world-wide success of ALUCOBOND® speaks for itself! Never compromise when it comes to quality and experience! Your nearest fabricator will provide a tailor-made solution which will last!





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# INSPIRATION

## **Dreams about claddings**

Whether your project is discreet or avant-garde, you can count on ALUCOBOND® to make your dream façades come true. Part of the success of ALUCOBOND® is due to its durability and resistance against corrosion. ALUCOBOND® adapts perfectly to the buildings' contours. It can easily be cut and shaped, without having to compromise on the factory applied surface finish. Whether soft curves or straight lines rising into the sky, ALUCOBOND® will provide an economical design. The superb properties of this material boost inspiration and offer a whole new range of innovative solutions to the building industry. Whether your project is a private home, a public building, a corporate headquarter or a trade or industrial complex, ALUCOBOND® can give it a distinguished look which will last forever.

## **Interior Design**

ALUCOBOND® also inspires new horizons in interior decoration, be it for galleries, reception areas, passage ways, shops, airports, banks or trade fairs and exhibitions. Through the use of exclusive colours and innovative shapes, this material offers impressive decorative solutions for the creation of outstanding and unique interior designs.

## **Renovation Work**

Any building in need of renovation can easily be given a rejuvenating facelift by using ALUCOBOND®-fast and economically. In addition to giving the existing structure long-term protection against the elements, the new façade will provide the old building with a fresh, new look. A carefully selected design solution and colour scheme will guarantee subtle integration into the existing environment.







# SUSTAINABILITY

*Features*

## **Environment, Health and Safety**

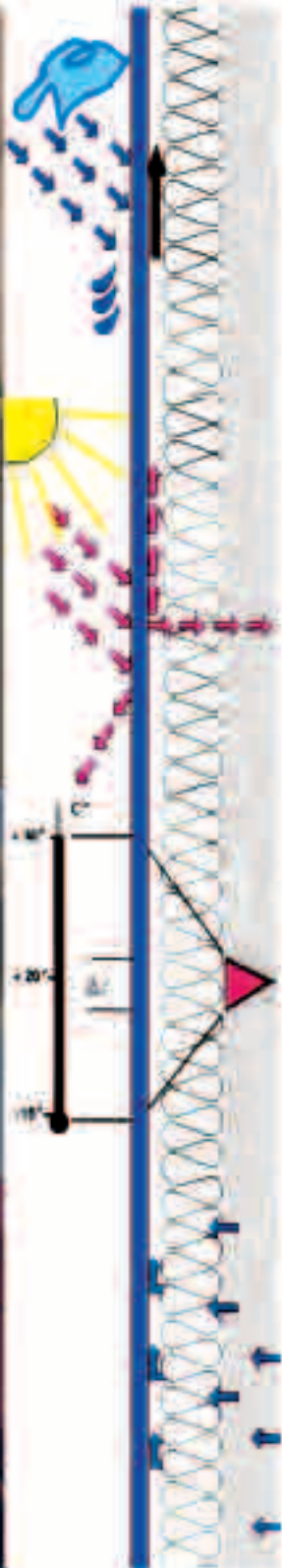
For ALCAN, effective, continuing environmental protection is a main priority. The company considers natural resources to be a basic asset to be preserved, in order to ensure forthcoming generations a future worth living. Considering itself a world leader in environmental protection, ALCAN introduced its own Environment, Health and Safety Programme which is strictly monitored and enforced at all production plants. With this, ALCAN commits itself to continuous improvement which by far exceeds existing regulations.

ALCAN was one of the first companies to develop its own Environmental Management System which is regularly reviewed by independent auditors. We have successfully achieved certification according to EN ISO 14001 standards.

## **Ozone Friendly**

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 environmental-friendly materials is literally a natural choice.





### Life Cycle

During decades of use in a rear-ventilated cladding system, ALUCOBOND® protects the building from weathering and the harmful effects caused by industrial and environmental pollution.

Advantages:

- Lower maintenance costs
- Long-term preservation of the building structure

An external cladding system using ALUCOBOND®, acts as a barrier against solar radiation. The ventilated space between the ALUCOBOND® and the wall or the thermal insulation (in climates which require additional insulation material) reduces the heat transmission.

Advantages:

- In winter: savings in heating cost
- In summer: savings in air-conditioning cost

The rear-ventilated cladding system protects the wall of the building from high and rapid temperature fluctuations.

Advantages:

- Reduction of thermal expansion/contraction
- Reduction in crack formation

Moisture can pass through the wall.

The building structure keeps dry.



### Recycling

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





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# SURFACES

*Features*

Welcome to the world of ALUCOBOND® - a world unlike that of other building materials. Designers and architects are attracted by the extraordinary flatness of ALUCOBOND®. Turn the pages and take a look at what the design world is doing today with this flat, formable, prefinished aluminium composite. Embark on a creative journey with ALUCOBOND® and start planning your very own stories of success in a world of innovative solutions. Prefabricated panel elements ensure fast installation. The light weight of ALUCOBOND® cladding elements makes handling on site very easy.





### **Image-building Design**

Exteriors are more attractive and more durable when clad with ALUCOBOND®. Style, elegant surfaces, exclusive corporate colours and outstanding construction details will create long lasting impressions. ALUCOBOND® is the perfect material if your organisation wants to create a new image.

ALUCOBOND® is unbeatable when it comes to colour consistency, excellent formability, flatness, rigidity, weather resistance and ease of maintenance. Whether a corporate office, a public building or a modern home, a creative design using ALUCOBOND® will make heads turn for many years to come. You won't find a better choice.





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# CURVES

*Features*

## **Flowing Contours**

Due to its composite structure, ALUCOBOND® can take on many different shapes. It is almost like a different skin wrapping the building structure. The panels can be bent, folded or shaped to form complex, flowing elements using simple, conventional tools and equipment. Its unique product features offer architects design options which are limited only by their imagination. Smooth roof structures, curved roof edgings and attics, balustrades around balconies, circular columns and arches can easily be realized. Its perfect formability does not affect its stability and flatness. The high rigidity of the panel remains. When compared with ALUCOBOND®, forming and shaping of any other material to create the same structure of equal durability could only be done at considerably higher cost. Special cladding systems developed by ALCAN COMPOSITES offer attractive low-cost solutions. Curved elements or column claddings are no problem for the fabricators. We say "even when ALUCOBOND® is curved, it is flat" and it will remain flat for its entire life-span.

Whether you are planning a new building or to refurbish an existing one, colourful surfaces and elegant details will give a building its own individual character.

Using ALUCOBOND® will ensure that it will last.






### **The Building Material**

The innovative product conception of ALUCOBOND® combines seemingly contradictory properties such as excellent formability and stability, low weight and large sizes, brilliant colours and weather resistance, just to mention only a few.

The combination of all these advantageous characteristics makes ALUCOBOND® one of the most versatile materials for interior and exterior design.

Public buildings, administrative buildings, residential buildings, post offices, hospitals, trade centres, airports, cultural centres and schools greatly influence our social lives and, at the same time, give our cities their individual character. ALUCOBOND® offers a tailor-made solution for every project.



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# COLOURS

*Features*

### **Variety of Colours**

From a wide range of standard colours, customers can select both metallic and solid colours.

Custom colours are available on request.

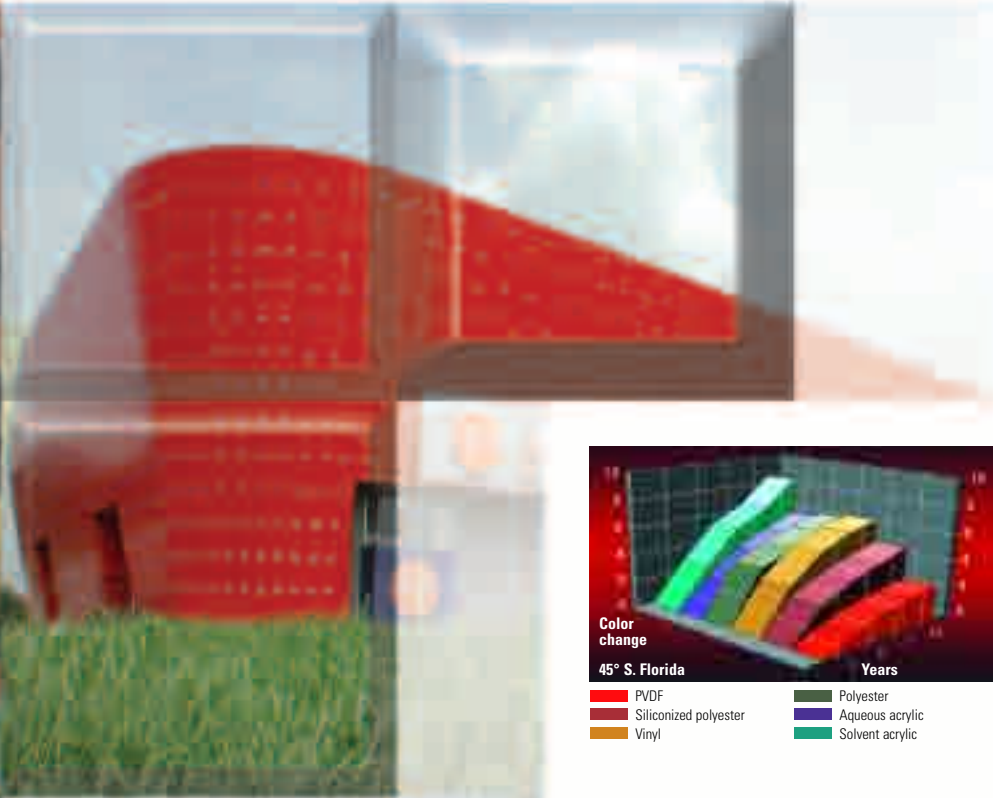
The gloss for solid and for metallic colours is in the range of 30-40% according to Gardner Scale, which is most suitable for architectural applications. For special effect colours, the gloss is in the range of 70-80% according to Gardner Scale. Due to their high gloss, panels coated in special effect colours need special care in the design and during fabrication and installation.

### **Lacquering**

ALUCOBOND® surfaces are coated using exclusively high-quality lacquer systems which have an optimum resistance against the effects of strong solar radiation, weather and industrial pollution. These properties are achieved by using UV resistant bonding agents. For standard finishes, Fluoropolymer (e.g. PVDF or PVF2) top coats are used. The coating systems combine good formability and excellent surface durability.

Alcan Singen GmbH apply all lacquer-based surface finishes in their own plant to the aluminium coil, prior to lamination into a composite panel. They use a continuous coil coating line which is based on the latest technology. The multiple layers of the coating are individually baked at temperatures of between 200-260°C.

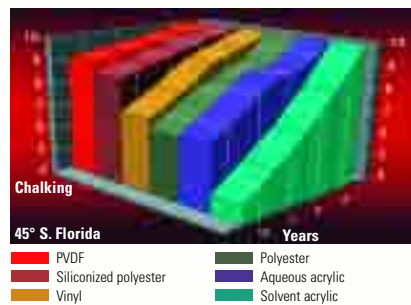
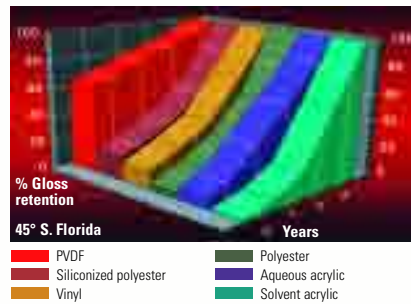
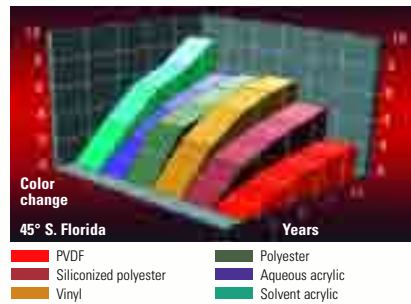




The long-term durability of coatings can be compared by measuring

- Colour change
- Gloss retention and
- Chalking

The superiority of UV resistant lacquer systems (PVDF) is shown in the three graphs. The values indicated are taken from the test conducted by the American Coil Coating Association (NCCA) on lacquered surfaces which were exposed to the extreme climatic conditions of South Florida for several years.



### Quality

The fully automatic coil coating process is computer controlled throughout all the stages. The quality of the coating is tested according to the standards established by the E.C.C.A. (European Coil Coating Association) of which Alcan Singen GmbH is a member.



# LIGHT AND RIGID

## *Features*

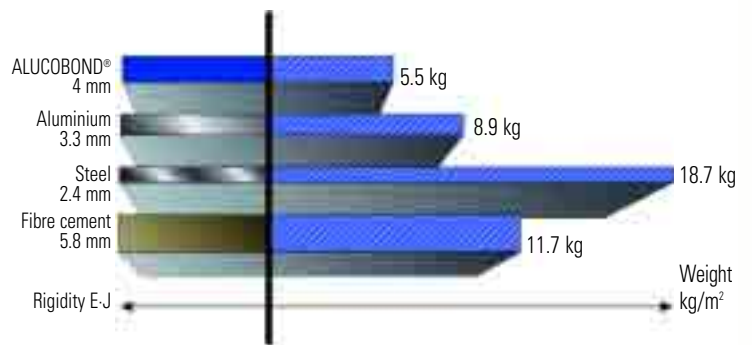


The composite structure of ALUCOBOND® - two aluminium cover sheets and a plastic or mineral filled core - results in an impressive strength-to-weight ratio, even when comparing large panel sizes. Despite its low weight, which makes ALUCOBOND® easy to transport and handle in the factory and on site, its rigidity and high strength make it the most suitable material for exterior wall cladding. When properly designed and installed, ALUCOBOND® panels will keep their shape and remain flat for life, even when exposed to extreme temperature changes.

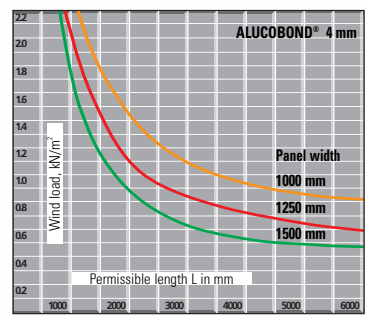
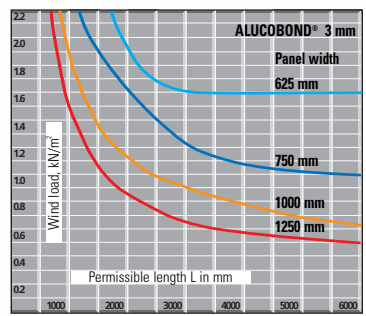




**Comparison of thickness and weight of panels with equal rigidity**



ALUCOBOND® compared with solid aluminium Required thickness and actual weights of panels with same rigidity					
Rigidity E-J	ALUCOBOND®			Aluminium	
	Section modulus W	Thickness	Weight	Thickness	Weight
1250 kN cm <sup>2</sup> /m	1.25 cm <sup>3</sup> /m	3 mm	4.5 kg/m <sup>2</sup>	2.7 mm	7.3 kg/m <sup>2</sup>
2400 kN cm <sup>2</sup> /m	1.75 cm <sup>3</sup> /m	4 mm	5.5 kg/m <sup>2</sup>	3.3 mm	8.9 kg/m <sup>2</sup>



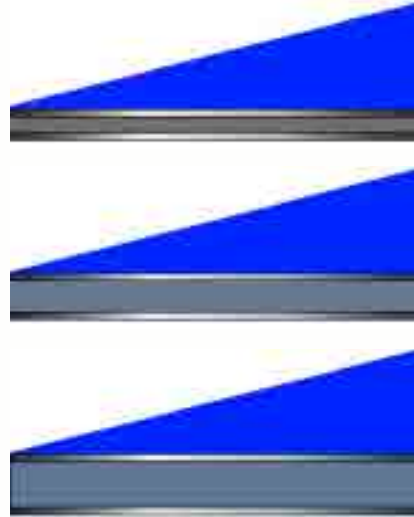
**Wind load and permissible panel sizes**

The graphs for 3 mm and 4 mm thick ALUCOBOND® indicate the maximum permissible panel length (without having to add a stiffener) based on applicable design wind load and panel width.

- Note:
- Permissible stress = 53 N/mm<sup>2</sup> (includes safety)
  - Values apply to 4-side supported panels
  - Values for other systems on request



# PRODUCT INFORMATION



ALUCOBOND® is a composite panel consisting of two aluminium cover sheets of Peraluman alloy - 100 (AlMg1), EN AW - 5005 A according to EN 485-2 and a plastic or high mineral filled core.

ALUCOBOND® is produced with various core thicknesses in a continuous lamination process.

All painted panels are supplied with a protective peel-off foil.

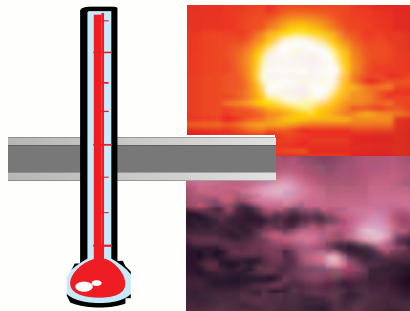
Product Range		
<b>ALUCOBOND®</b> One side coil coated lacquer finish	Thickness Width Length	4 mm (3, 6 mm*) 1000 mm, 1250 mm, 1500 mm up to 8000 mm
<b>ALUCOBOND® PLUS</b> One side coil coated lacquer finish	Thickness Width Length	4 mm (3 mm*) 1250 mm, 1500 mm up to 8000 mm
<b>ALUCOBOND® A2</b> One side coil coated lacquer finish	Thickness Width Length	4 mm (3 mm*) 1250 mm, 1500 mm up to 8000 mm
<b>Upon request:</b>	Other surfaces  Special widths Special lengths	mill-finish both sides coil coated lacquer, both sides colourless anodised <sup>1)</sup>

\*) Upon request - 1) Please note: All anodised ALUCOBOND® composite panels have contact lines (about 25 mm width) on their short sides. Please take this into consideration when dimensioning the panels.

Technical data		ALUCOBOND®			PLUS	A2	
Thickness:		3 mm	4 mm	6 mm	4 mm	3 mm	4 mm
Cover sheet, thickness	[mm]	0.50			0.50	0.50	
Weight	[kg/m <sup>2</sup> ]	4.5	5.5	7.3	7.6	5.9	7.6
Width	[mm]	1000/1250/1500			1250/1500	1250/1500	
<b>Technological data:</b>							
Section modulus	W [cm <sup>3</sup> /m]	1.25	1.75	2.75	1.75	1.25	1.75
Rigidity	E-J [kNcm <sup>2</sup> /m]	1250	2400	5900	2400	1250	2400
Alloy		EN AW - 5005 A (AlMg1)					
Mechanical properties of the cover sheets		H22/H42, according to EN 573-3					
Modulus of elasticity	[N/mm <sup>2</sup> ]	70,000					
Tensile strength of cover sheets	[N/mm <sup>2</sup> ]	R <sub>m</sub> ≥ 130					
Proof stress (0.2%)	[N/mm <sup>2</sup> ]	R <sub>p0.2</sub> ≥ 90					
Elongation		A <sub>50</sub> ≥ 5%					
Linear expansion		2.4 mm/m at 100°C temperature difference					

### Thermal insulating properties

Due to its relatively thin and homogeneous core, ALUCOBOND® is not an insulation panel.



### Temperature resistance

From -50° C to +80°C.

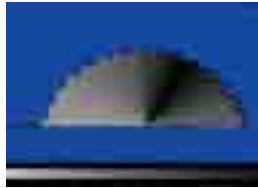
Acoustical properties:		ALUCOBOND®			PLUS	A2	
Thickness:		3 mm	4 mm	6 mm	4 mm	3 mm	4 mm
Sound absorption factor	$\alpha_s$	0.05			0.05	0.05	
Sound insulation	R <sub>w</sub> [dB]	25	26	27	(accord. to EN 20354, ISO 354) STC=30, OITC 24	27	27
Loss factor	d [mm]	0.0072	0.0087	0.0138	(accord. to ASTM 90)	(ISO/DIS 717-1, EN ISO 140-3) 0.004	0.005
(accord. to EN ISO 6721, frequency range 100-3200 Hz)							

Rear ventilated ALUCOBOND® cladding considerably improves sound insulation. For example, the sound insulation of a light-weight concrete wall is double when clad with ALUCOBOND®. The loss factor (a measure for the acoustic sound-damping behaviour) of ALUCOBOND® is approx. 6 times better than that of solid aluminium sheets.

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# PROCESSING



## Cutting

ALUCOBOND® can be cut with a vertical panel saw, circular or jig saw.

### Conditions for cutting with a circular saw:

Cutting tools/carbide tipped, blade geometry:

Thickness of cutting teeth approx. 2-4 mm;

Tapered from outside to inside to prevent jamming.

Tooth geometry: Trapeze tooth/flat tooth

Pitch t: 10-12 mm

Clearance angle  $\alpha$ : 15°

Rake angle  $\gamma$ : 10° (positive)

Max. cutting speed v: 5000 m/min.

Max. feed s: 30 m/min.



## Shearing

Shearing can be done with a guillotine.

To prevent surface damage, use protective pads between down-holders and ALUCOBOND® surface and adjust to minimum down holding pressure.

Use carpet protection on feeder table.

Do not use ball supports as they damage the ALUCOBOND® surface.

Shearing will cause a slight deflection of the cut edge on the impact side.



## Drilling

ALUCOBOND® can be drilled with twist drills normally used for aluminium and plastics on machines common for metals.

Drill material:

High-speed steel (HSS)

We recommend metal drills with centre-point.



## Contour cutting

ALUCOBOND® can be cut to shape using CNC machining centres, water jet cutting machines, copy routers and jig saws.





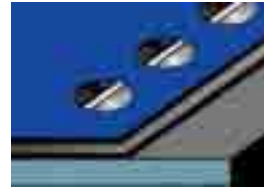
### Punching

ALUCOBOND® can be punched using conventional sheet metal punching machines or manual notchers. For clean cuts use sharp tools and dies with minimal cutting clearance. Punching will cause a slight deflection of the cut edge on the impact side.



### Roll bending

ALUCOBOND® can be bent using a roll bending machine (pyramid or pinch rollers). To protect the surface finish of ALUCOBOND® during bending use only polished rollers free of dents and other defects.



### Screwing

Use conventional wood, sheet-metal or machine screws made of stainless steel.

For exterior applications allow for thermal expansion and possible building movements.



### Bending

Bending is possible with a folding table or a bending press. Min. required inside radius:

- For ALUCOBOND®:  $r = 10 \times t$
  - For ALUCOBOND® PLUS:  $r = 10 \times t$
  - For ALUCOBOND® A2:  $r = 25 \times t$
- $t$  = panel thickness

To protect the surface finish of ALUCOBOND® during bending use padding strips. The spring-back of ALUCOBOND® is greater than that of a solid aluminium sheet.

To determine spring-back for serial production, make tests on sample panels.



### Riveting

Riveting is possible using solid or blind rivets with conventional riveting tool. For exterior applications allow for thermal expansion and possible building movements.



### Clamping

With serrated corner-joint or butt-joint sections or clamped between special aluminium extrusions.



### Welding

The plastic core of ALUCOBOND® can be hot-air welded using conventional hot-air welding equipment and plastic filler rod. Hot-air welding provides a water-tight joint for decorative purpose only. It is not suitable for joints where structural strength is required.



### Bonding

For exterior use and structural applications:

- Adhesive sealing compounds
  - Double-sided VHB tapes
- Consult sealant manufacturer for correct application.

For interior applications:

- Metal adhesives
- Double-sided VHB tapes

Adhesives and sealants do not adhere to the plastic core! Apply to the aluminium cover sheet only!



For further information please ask for our brochure ALUCOBOND® Processing.

# ALUCOBOND®



[www.alucobond.com](http://www.alucobond.com)



**ALCAN COMPOSITES -  
A worldwide organisation**

- Alcan Airex AG, Sins, Switzerland
- Alcan Kapa GmbH, Osnabrück, Germany
- Alcan Singen GmbH, Singen, Germany
- Alcan Thermoplastics, Chelmsford, UK
- Alcan Composites USA Inc., St. Louis
- Alcan Composites Ltd., Shanghai, China
- Alcan Composites Brasil S.A., São Paulo

**ALCAN COMPOSITES -  
A true "global player"**

- Sales offices and production sites in Europe, North and South America, and Asia
- Large variety of panels
- Partnerships with leading distributors
- Professional sales teams

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