ALUCORE®

Processing

Architecture Display Transport Industry

3A COMPOSITES

Processing at a glance

Cutting and Fabricating

Sawing see page 5

- vertical panel saw, circular saw or jig saw

Routing see page 6

- CNC machining centres and circular panel saws

Drilling see page 6

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- large holes with countersinks and counterbores

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- routing and folding technique or with bending press

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- routing
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Transport
Storage
Handling

ALUCORE® is a prefabricated panelling material with lacquered, foil-laminated or mill-finished surfaces.

These surfaces are protected by a special foil during transport, storage and processing. The following points must be taken into consideration when storing and handling panels:

• Pallets must be handled carefully during transport and unloading.
(Caution: do not move open pallets)

• Upon delivery, pallets must be examined for any damage due to moisture (ALUCORE® panels that have become wet must be dried to avoid the formation of spots or corrosion). Any damage must be reported immediately and confirmed by the forwarding agent.

• Store pallets so that they are protected against wetness penetrating due to rain and spray water and avoid the formation of condensation (e.g. when transporting cold panels into warm rooms).

• Store pallets stacked one above the other (do not store ALUCORE® panels standing vertically), with a maximum of 6 pallets of the same format stacked on top of each other (heavy pallets at the bottom).

• Individual panels must be lifted off the pallet by two people holding all four corners and not drawn over each other. Carry panels vertically. Wear gloves to avoid making any marks on them.

• To avoid marks, do not place anything between the panels when stacking them.

The following points should be observed as regards the ALUCORE® protective foil:

• Storage exceeding 6 months should be avoided.

• Strong fluctuations in temperature and direct insolation also reduce long-term durability.

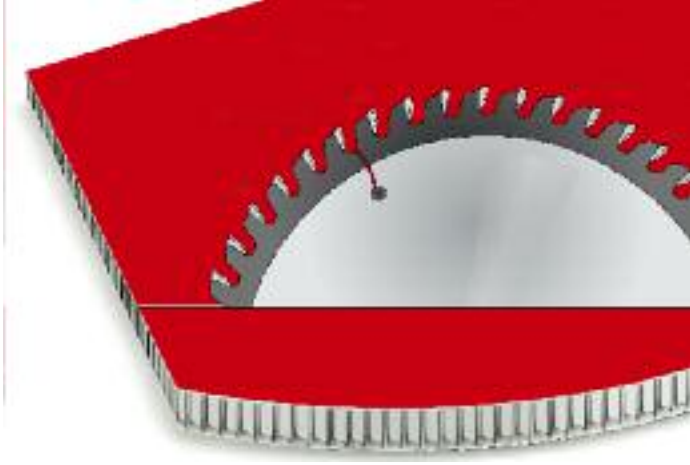
• Do not the foils with ink (markers), adhesive tape or labels. The solvents and softeners could penetrate the foil and damage the lacquered surface.

• Should the protective foil partially come off during processing, dirtied edges can occur in the course of time.

• After assembly, the protective foil must be removed as soon as possible since it is very difficult to remove foils that have been exposed to weather conditions for a long time.

• The protective foil should not be removed at temperatures below 10° C.

Cutting and Fabricating



Sawing

Carbide tipped (CT) saw blades

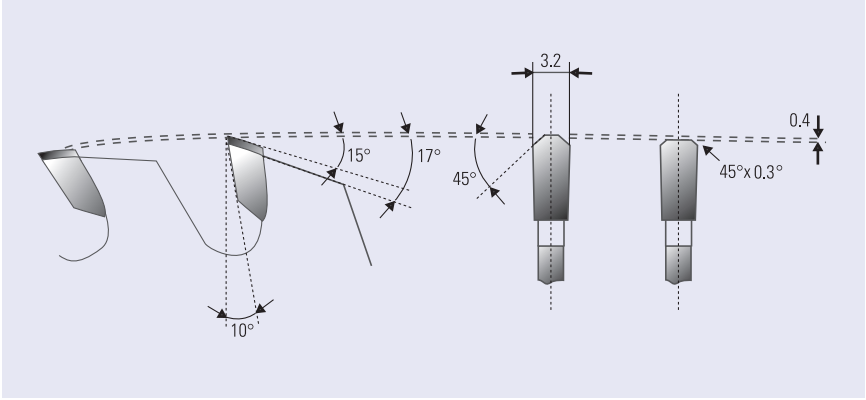
Blade geometry	Tooth thickness approx. 2 - 4 mm, tapered to the side to prevent jamming
Tooth geometry	trapeze tooth / flat tooth
Pitch t	10 - 12 mm
Clearance angle α	15°
Rake angle γ	10° positive
Maximum cutting speed v	5,000 m/min
Maximum feed s	30 m/min

Carbide tipped (CT) saw blades for HOLZ-HER and Striebig circular panel saws

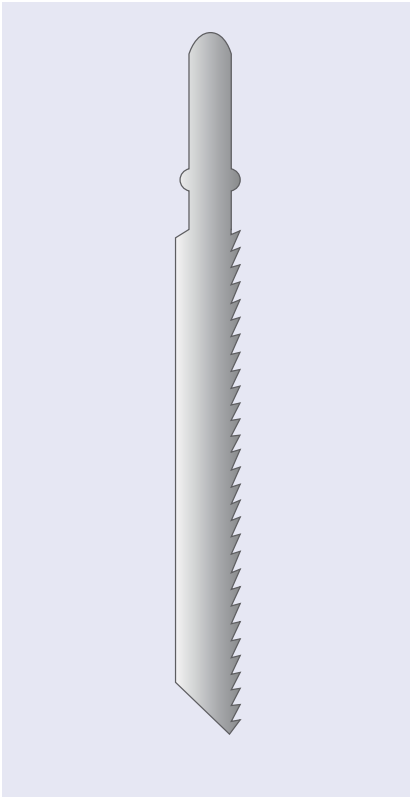
Trapezoid/flat tooth saw blades, flat teeth 45° chamfered for burrfree edges

Saw blade Ø	D = 300 mm (for Striebig panel saw Standard II)
Number of teeth	Z = 72 LEUCO- Best.Nr. 181724
Saw blade Ø	D = 250 mm (for Holz-Her panel saw 1255 ALUCOBOND®)
Number of teeth	Z = 60 LEUCO- Code No. 181726
Bore Ø	d = 30 mm
Tooth thickness	3.2 mm
Clearance angle	15°
Rake angle	10° positive
Manufacturer/Supplier:	Leuco Ledermann GmbH & Co.KG Phone +49 74 51 93 0 Fax +49 74 51 93 270 www.leuco.com

Sketch showing edge geometry for professional resharpening:



Jig saw blades
For wood or plastics, e.g. T101 B (Bosch),
tooth thickness 2.5 mm for precision cuts



Routing

ALUCORE® can be easily routed on conventional routing machines and CNC machining centres.

To avoid pressure marks on the surface, please use plastic or wood vice jaws when chucking the workpieces.

High-speed steel or carbide tipped cutters suitable for aluminium and ALUCORE® have a wide tooth pitch, radiused and smooth grooves and small lip angles.

They produce perfect cuts, under the following conditions:

- High-speed steel (HSS)
  max. cutting speed 3,000 m/min.
  max. feed 25 m/min.
- Carbide tipped (CT) cutters
  max. cutting speed 5,000 m/min.
  max. feed 30 m/min.

Suitable end milling cutters for ALUCORE®:
HSS end milling cutter, shank Ø 8 mm

Carbide tipped cutter Series F 113

Manufacturer / Supplier:
GIS Gienger Industrieservice
Phone +49 74 61 16 20 20
Fax +49 74 61 16 20 21
www.gis-tec.de

Drilling

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

Drill material:
High-speed steel (HSS)

Tool geometry:
Lip angle: 100 ° - 140 °

Drilling without burr is possible using the following drills:

Spot facing cutter with centre-point.

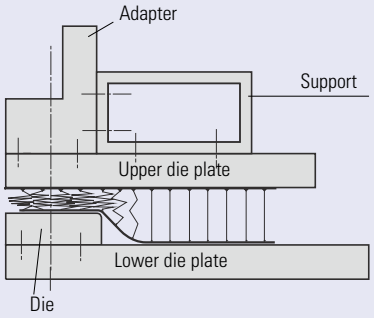
Angle of twist: 30 ° - 45 °

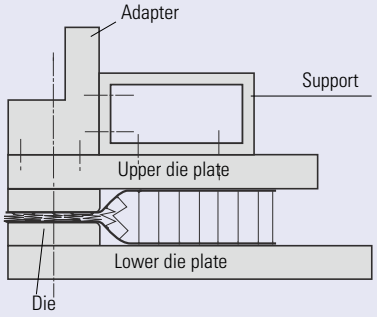
e.g. Extreme 2TM HSS-G metal drill DIN 338 of De WALT, Idstein, Germany

Pressing / Stamping

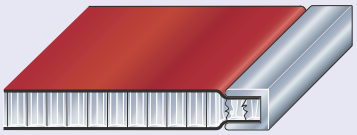
ALUCORE® composite panels can be pressed. The core is compressed without destroying the viscoplastic bonding system. This offers new processing and application possibilities.

For more information, please refer to the separate leaflet “Pressing ALUCORE® composite panels".





Flush joint with H section



Flush edging with lining section

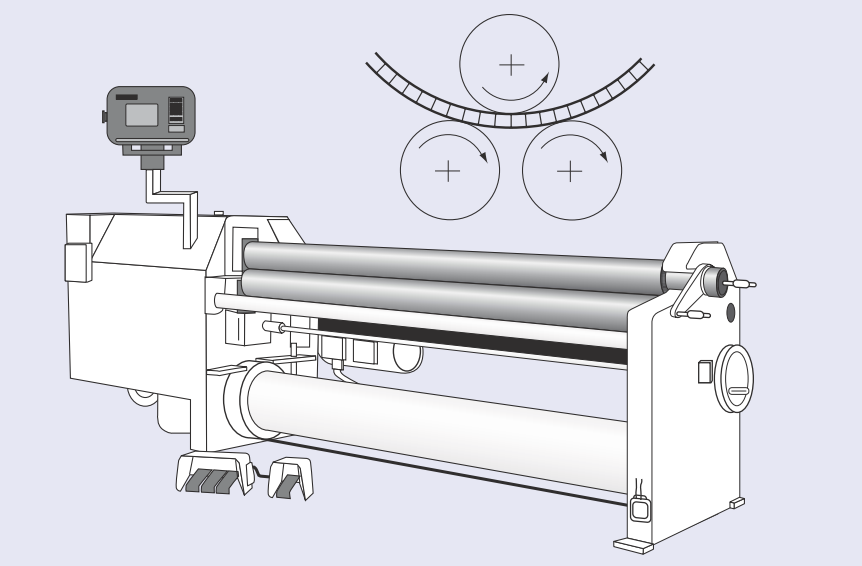
Overlapping panel joint

Bending with a roll bending machine

ALUCORE® composite panels of 6 and 10 mm thickness can be bent using three and four-roll bending machines with relatively close radii. The viscoplastic composite system enables radii to be produced from 300 mm with a panel thickness of 6 mm and from 700 mm with a panel thickness of 10 mm. The minimum diameter of the rolls should be 150 mm.

The values for adjusting the rolls have to be determined by trial. The bending rolls must be thoroughly cleaned of swarf before processing ALUCORE®.

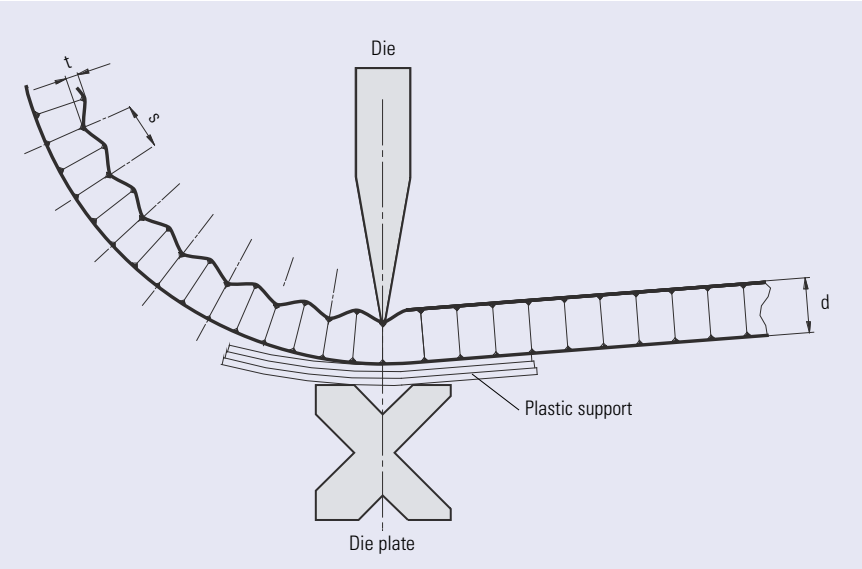
The surface should be protected from damage by affixing plastic strips of 1 - 2 mm thickness during processing.



Step-bending with bending presses

ALUCORE® can be shaped using the step-bending process. The bending radius is determined by the stamping depth t, the stamping distance s and the panel thickness d.

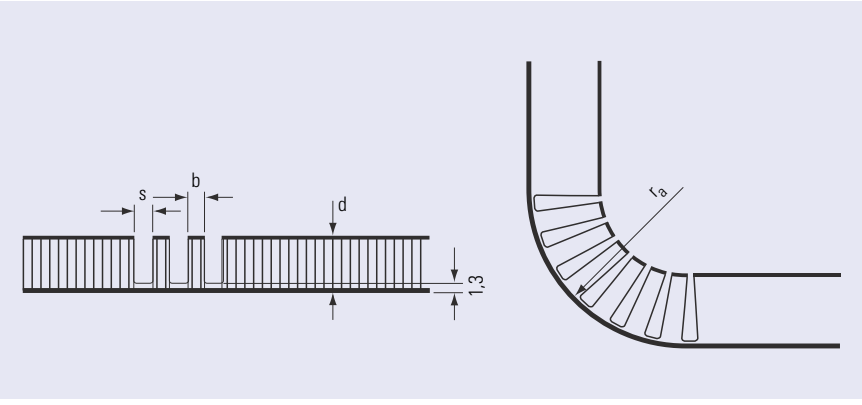
Please ask for details.

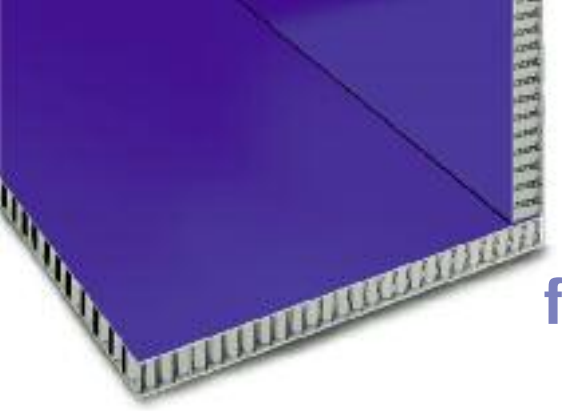


Bending with saw cuts

ALUCORE® can be bent by applying saw cuts on the rear side of the panel. The required radius r_a is determined by the tooth thickness s, the wall thickness b, the panel thickness d and the number of saw cuts.

The saw cuts are carried out using the recommended saw blades. To obtain a final thickness of 1.3 mm, corresponding tracing rollers are attached to the saw blades of the vertical panel saws. Principally, bending should take place in the 1 mm thick cover sheet.





Folding technique

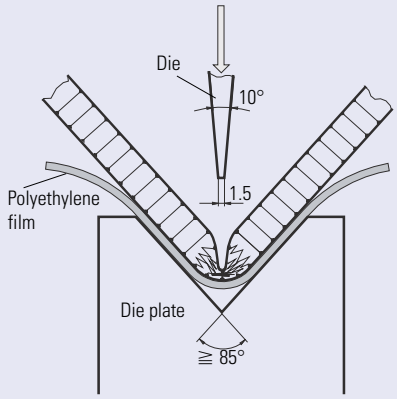
for individual shaping and design

Folding with the bending press

ALUCORE® can be folded on bending presses using the tool geometry shown in the sketch.

When measuring cuts, the material gain for the corresponding thickness must be taken into consideration when making 90° folds.

Panel thickness (mm)	Bending radius outside (mm)	Material gain (mm)	Folding height min. (mm)
6	~4	2.7	20
10	~9	5.0	25
15	~13	7.5	35
20	~16	8.5	50
25	~18	10.0	60



Routing and folding technique / producing corners and edges

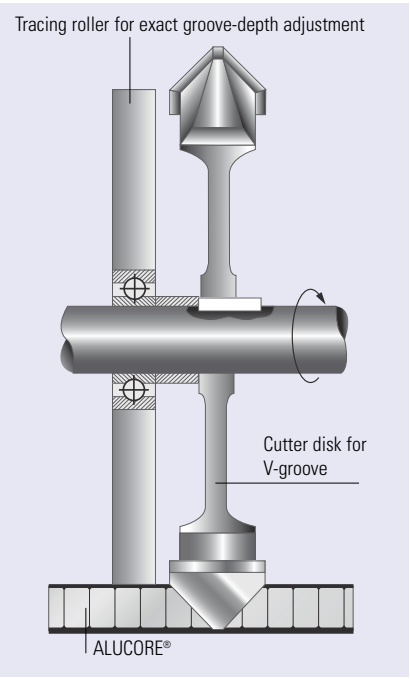
Corners and edges can be produced simply on ALUCORE® panels using the routing and folding technique. With all versions, a groove is routed on the rear of the panel into the 1 mm thick cover sheet at the front.

In **version 1**, as with ALUCOBOND®, a cutter disk or forming cutter for V-grooves 90° is used in the appropriate width.

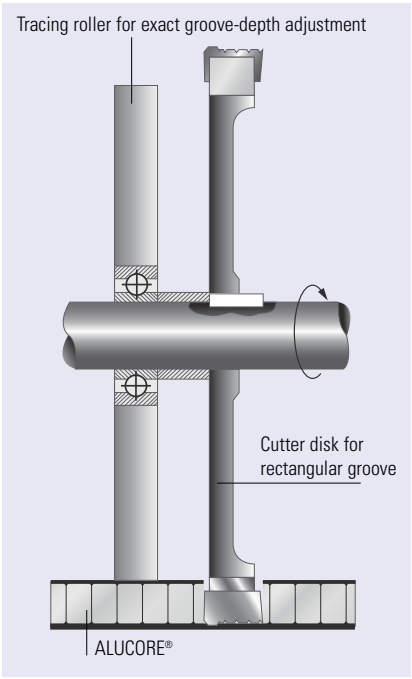
In **version 2**, the core of the panel is pre-cut using special tools.

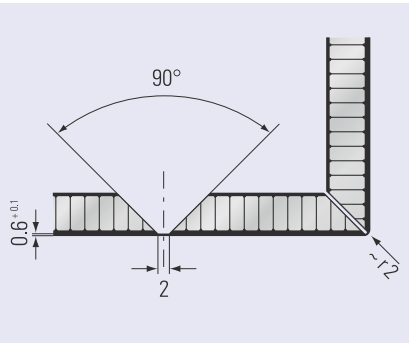
The grooves can be produced with circular panel saws and CNC machining centres. Normally, folding by hand is possible. If this is not possible, we recommend the use of a folding machine.

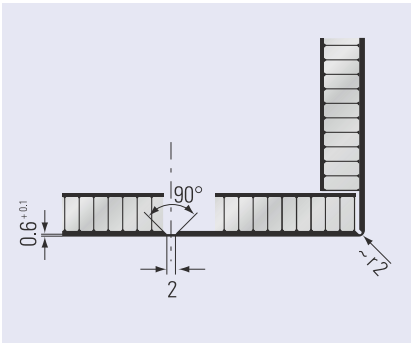
Version 1



Version 2







Important:

These are customized design tools to match the respective machine and can be ordered by the processor from the recommended manufacturers. Please state the tooth geometry, tool diameter, etc.

The auxiliary tracing rollers can be produced from the existing ALUCOBOND® tracing rollers for 4 or 6 mm thickness.

Machinery for routing and folding technique

Vertical panel saws ALUCOBOND® / ALUCORE® routing device (customized accessory)

For V-shaped grooves of up to 10 mm panel thickness and for rectangular grooves

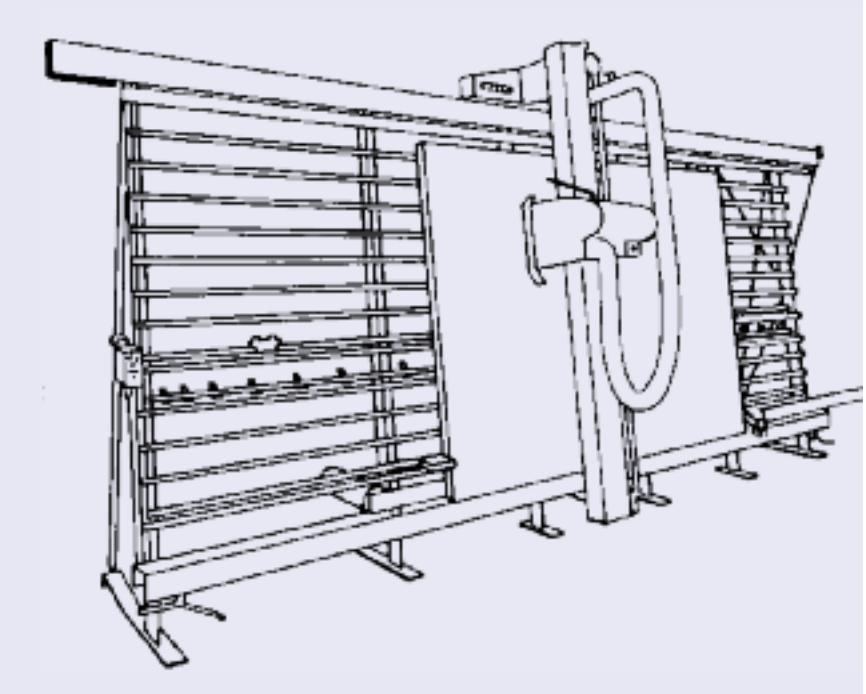
Holz-Her Vertical panel saw
PK 1255 ALUCOBOND®
ArticleNo. 278.6133

Striebig vertical panel saw
Standard II for composite panels

Manufacturers / Suppliers
Reich Spezialmaschinen GmbH
Phone +49 70 22 7 02 0
www.holzher.de

Striebig AG Maschinenbau
Phone +41 41 2 59 53 53
www.striebig.com

Other panel saws can subsequently be provided by the above manufacturers with an additional routing device. Please ask for details.

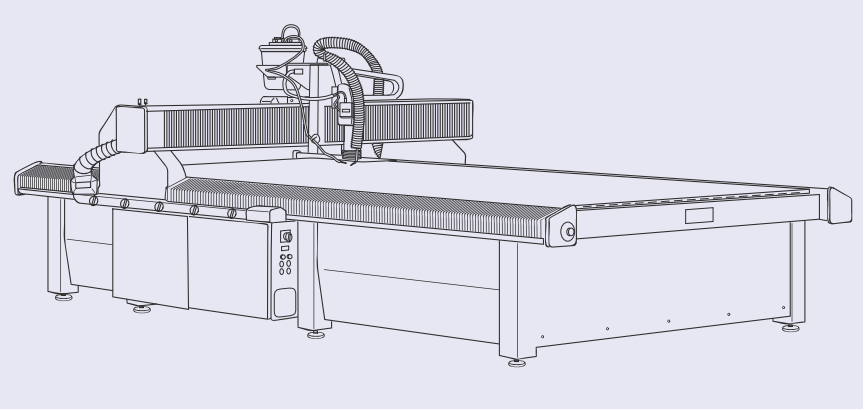


CNC machining centres

With large panel thicknesses such as 10 mm, V-grooves cannot be produced with vertical panel saws (cutter edge width max. 20 mm). CNC machining centres are used for this purpose.

Rectangular grooves can also be produced on CNC machining centres.

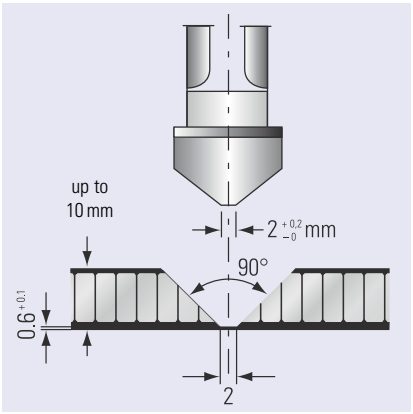
Please ask for manufacturers of CNC machining centres.



Tools for routing and folding

The following points must be taken into consideration:

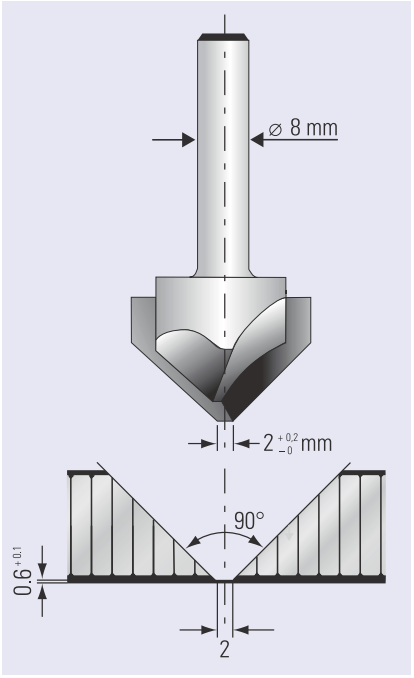
- The edges should not be bent back and folded a second time.
- The width of the base cutter edge must be 2 mm.
- The grooves should basically be routed in the 1 mm thick cover sheet.
- After routing the remaining metal sheet must be $0.6^{+0.1}$ mm thick.



Cutter disk for V-grooves 90°

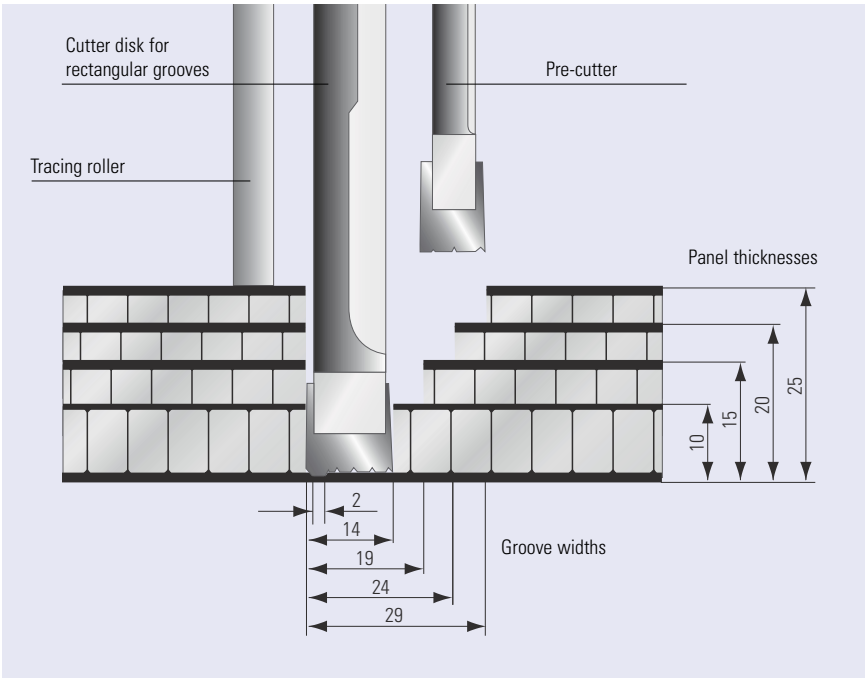
For panel thicknesses of 6 and 10 mm a milling cutter for 90° V-grooves with a cutter edge width of 20 mm must be used on circular panel saws.

Customized design by Speiser



End milling cutter for V-grooves 90°

With cylindrical shank of the corresponding diameter for all panel thicknesses.
Customized design by KWO



Milling cutter for rectangular grooves for ALUCORE® 10 mm with additional pre-cutter for ALUCORE® 15, 20 and 25 mm

Customized design by OERTLI.

Please ask for details.

Instead of the milling cutter for rectangular grooves a special saw blade, as shown on page 11, may also be used.

Supplier for end milling cutters

KWO-Werkzeuge GmbH
Phone +49 73 26 96 42 0
Fax +49 73 26 96 42 10
www.kwo.de

Supplier for cutter disks for V-grooves and special saw blades

Speiser
Werkzeugvertriebs-GmbH
Phone +49 74 56 94 49 0
Fax +49 74 56 94 49 0
www.speiser-werkzeugtechnik.de

Supplier for cutter disks for rectangular grooves and for pre-cutters

OERTLI Werkzeuge AG
Phone +41 1 863 75 11
Fax +41 1 860 59 29
www.oertli.ch

ALUCORE® panel edgings

Producing edgings by folding the cover sheet

Routing the panel by means of a special saw blade

Carbide tipped saw blade, tooth geometry, trapeze tooth (customized design by Speiser)

Bore ø	d = 30 mm
Saw blade ø	D = 244 ± 0.05 mm
Number of teeth	z = 40
Tooth thickness	= 3.2 mm
Clearance angle	= 15°
Rake angle	= 10° positive
Width of base cutter at trapeze tooth	= 2 mm

Supplier:
Speiser
Werkzeugvertriebs-GmbH
Phone +49 74 56 94 49 0
Fax +49 74 56 94 49 0
www.speiser-werkzeugtechnik.de

Depending on the saw blade diameter and the panel thickness, a corresponding tracing roller, as with the routing and folding technique for ALUCOBOND®, is required to keep the precise routing depth (remaining sheet thickness $0.6^{+0.1}$ mm). For the panel thickness the corresponding diameter is turned from the tracing rollers for ALUCOBOND®.

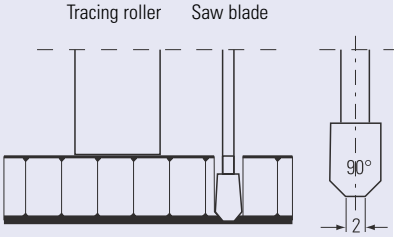
After routing the panel, the honeycomb core and the rear cover sheet are cut off using a joint cutter.

Routing the panel with a cutter disk for rectangular grooves

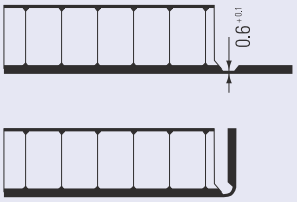
A further possibility for preparing the panel edging for cover sheet folding is routing using a cutter disk for rectangular grooves. For panel thicknesses of 15, 20 and 25 mm a pre-cutter or a joint cutter is used to remove the remaining core.

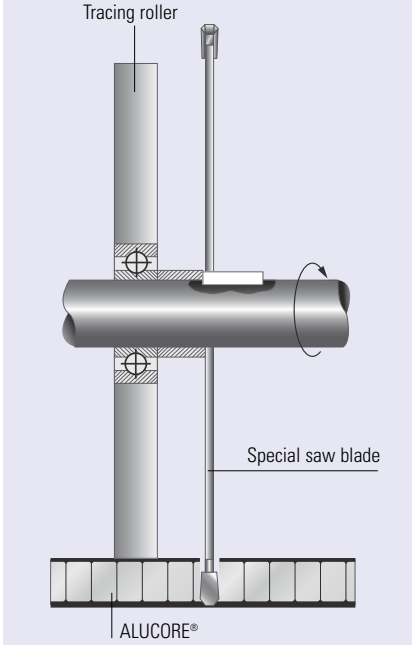
Folding the edges of the cover sheets

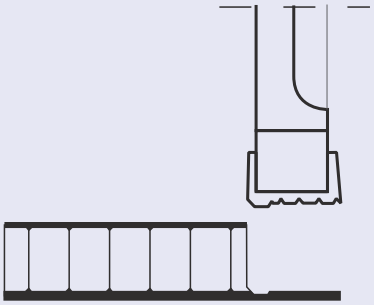
We recommend folding the edges of the cover sheets with a folding machine as better results are obtained using this method.

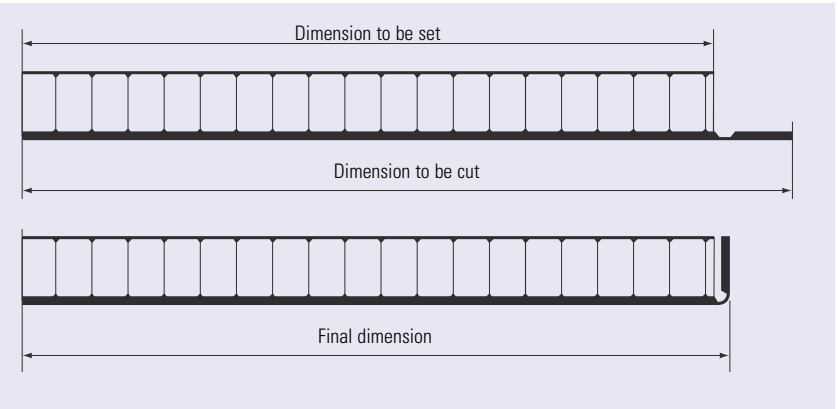


With 6 and 10 mm thick ALUCORE® panels routing is generally carried out in the 1 mm thick cover sheet.









Calculating the dimension to be cut

Depending on the type of edging, the panel thickness is added to the final width or length, and the thickness of the cover sheet of 1 mm is then deducted.

Example:

Desired final dimension	800 mm
	+15 mm
	-1 mm
Dimension to be cut	**= 814 mm**

Dimension to be set on the panel saw

Dimension to be cut	Example: 814 mm
Less panel thickness	-15 mm
Less 1 mm thickness of cover sheet	-1 mm
= Dimension to be set	**= 798 mm**

Types

Joint cutter

Oscillating joint cutter
Super Cut
Type FSN 400 E
Reference No. 7 236 28

Cutter

Straight form
Reference No. 6 39 03 117 01 5

Supplier:

C. & E. Fein GmbH
Phone +49 7173 183 0
Fax +49 7173 183 800
www.fein.de

ALUCORE® panel edgings

Producing edgings by means of edge bands

ALUCORE® edges can be closed decoratively by filling them with melamine resin and applying edge bands.

Producing edgings using edging sections

An optically attractive edging can be produced by routing the edges of ALUCORE® panels with a disk milling cutter and subsequently inserting edging sections.

Cutting the groove

A disk milling cutter and a hand routing machine or CNC machining centre are used to cut a groove into the core at the ALUCORE® edges:

Carbide tipped disk milling cutter for grooves
Diameter D = 40 mm
Width of edge W = 2.5 mm
Bore ø d = 6 mm, Reference No. 37329

Cutter mounted on a mandrel with ball bearing
Shank ø 6 mm, Reference No. 37910
Shank ø 8 mm, Reference No. 37912

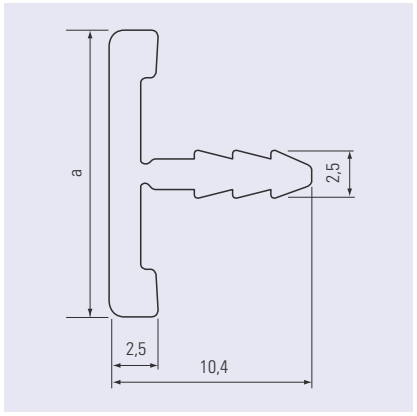
For better guidance a second ball bearing is required:
Ball bearing ø 19 mm, Reference No. 00504

Supplier:

KWO-Werkzeuge GmbH
Phone +49 73 26 96 42 0
Fax +49 73 26 96 42 10
www.kwo.de

Producing edgings by filling and contour-cutting the edges

Edgings can also be produced by filling the ALUCORE® edges with plastic material and subsequently cutting the contour of the edges by means of end milling cutters. With this method, the cover sheets can be routed visibly or the ALUCORE® edges are filled with plastic material protruding over the edges and then cut or ground.



Aluminium edging sections are available for all panel thicknesses.
Please ask for details:

Edging section No.	ALUCORE® Panel thickness a
41213	6 mm
41214	10 mm
41215	15 mm
41216	20 mm
41217	25 mm

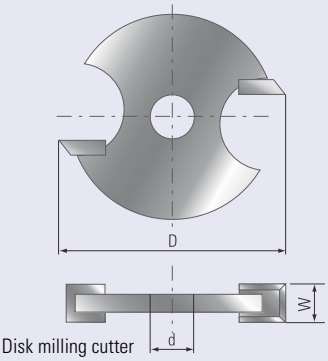
Prior to inserting the sections, a bonding agent is filled into the grooves to secure them. The bonding agent firmly fixes to the honeycomb core and section teeth, thus preventing the sections from slipping out.

Bonding agent

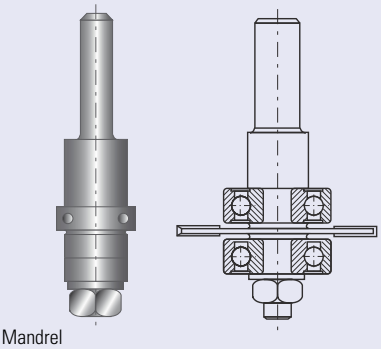
Fix All Crystal
Permanently elastic, transparent structural adhesive

Supplier:

SOUDAL
Phone +49 214 690 40
Fax +49 214 690 423
www.soudal.com



Disk milling cutter for grooves



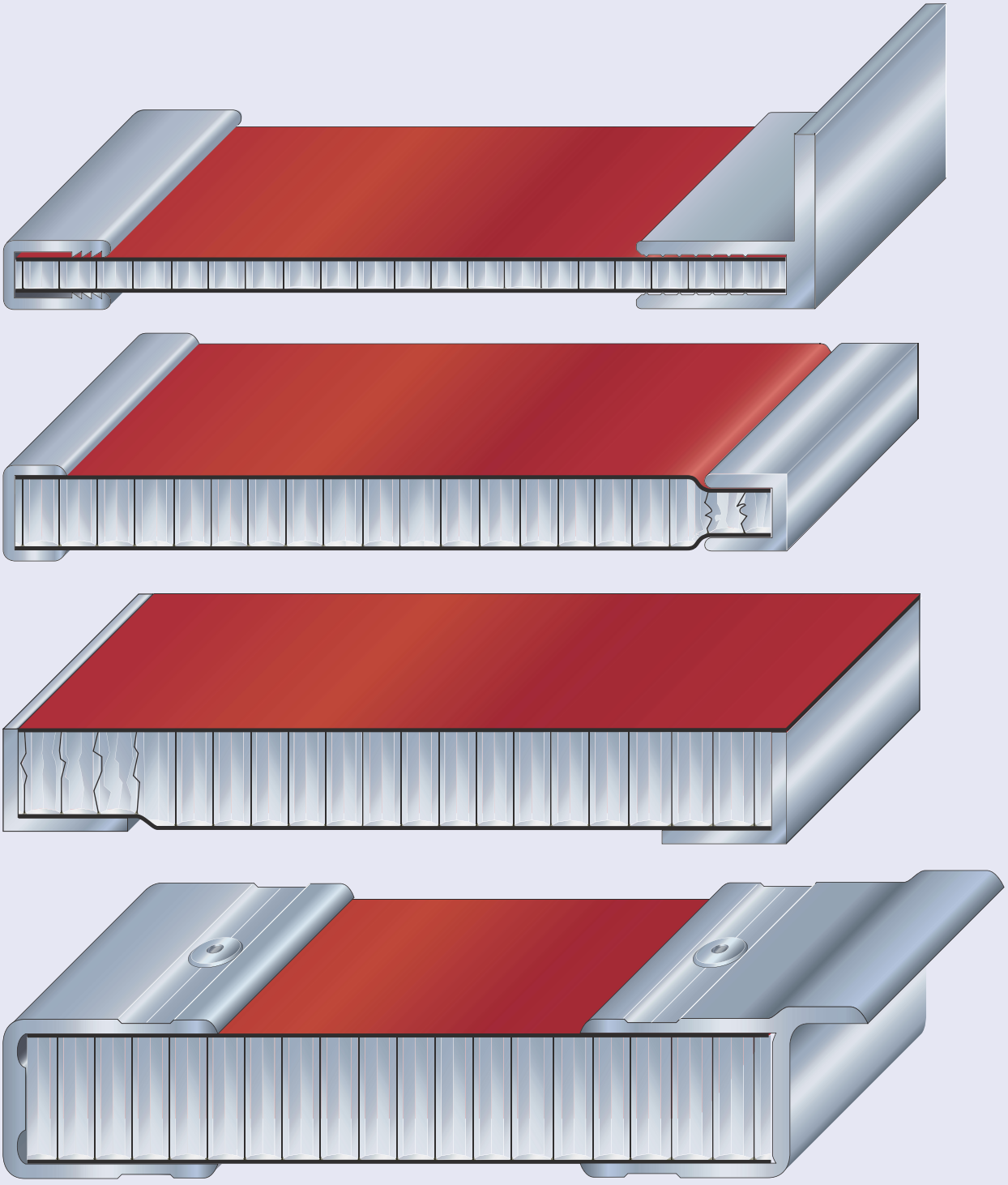
Mandrel

Hand routing machine

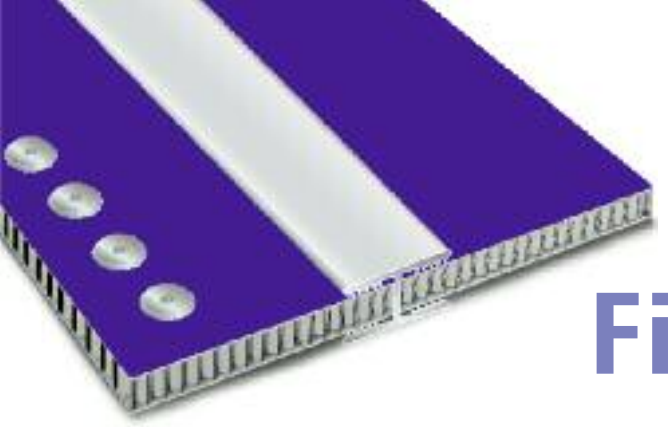
Producing edgings using panel edging sections

Depending on the type of application, edging sections of various shapes can be attached to the ends of the ALUCORE® panels. They are fixed to the panel by bonding, clamping or riveting to the cover sheet.

Examples



For sections please ask for details.



Jointing / Fixing Technique

ALUCORE® can be joined by means of standard processes used in metal and plastics technology. If ALUCORE® is to be joined to structural parts of metals other than aluminium, or if fasteners (e.g. bolts, screws) are to be used, the following material guidelines should be observed:

Fasteners and structural parts made of aluminium, plastic or stainless steel should be suitable for assembly with ALUCORE®.

When using other materials please insert insulating washers or apply protective a coating to prevent corrosion.

Please take the thermal expansion of the panel into account for outdoor use of ALUCORE® to avoid jamming or deformation.

The minimum gap depends on the expected expansion of the panel.

Please refer to processing recommendations for rivets and bolts for additional measures to prevent jamming.

The linear thermal expansion of ALUCORE® is determined by the aluminium cover sheets.

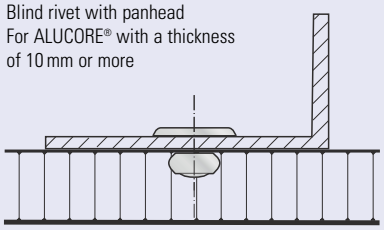
At a temperature difference of 100° C the longitudinal deformation is 2.4 mm/m length/width.

Rivets - not penetrating the panel

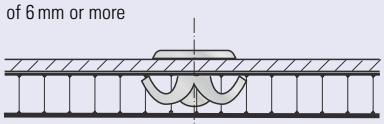
Rivets generally must be anchored in the 1 mm thick ALUCORE® cover sheets

Sections can be attached to ALUCORE® with commercially available rivets for aluminium constructions. After drilling a blind hole of the same diameter as the rivet shank, the rivets can be anchored in the cover sheet. As a rule, rivets with stainless steel mandrel are used.

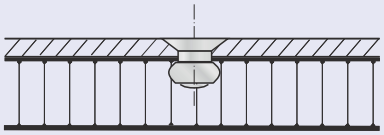
Blind rivet with panhead
For ALUCORE® with a thickness of 10 mm or more



Expansion blind rivet
For ALUCORE® with a thickness of 6 mm or more



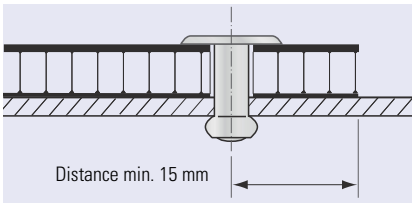
Blind rivet with countersunk head



Rivets - penetrating the panel

ALUCORE® panels can be joined together or fastened to other materials using rivet types commercially available for aluminium constructions. For outdoor use and for use in areas of high humidity, aluminium blind rivets with stainless steel mandrels are normally used to prevent ugly corrosive edges. When using aluminium blind rivets with steel mandrels, the mandrel should drop out after riveting (detachable version).

Countersunk rivets are not suitable.



For outdoor use please note:

- Use aluminium blind rivets that have been approved for construction with a 5 mm shank diameter and an attachment head diameter of 11 or 14 mm.
- Please take the thermal expansion of the panel into account (2.4 mm/m/100° C). To avoid jamming, the hole in the panel must be large enough to allow for expansion.
- With the shank of the rivet fitting closely to the edge of the hole, the attachment head must cover over 1 mm of the area surrounding the hole.
- Multi-step drills or sleeves having corresponding diameters are used for centrically drilling holes into the panel and the substructure and for centrically fitting the rivet.
- Rivet attachment jigs are used for fitting blind rivets without jamming allowing for a tolerance of 0.3 mm. Make sure to use rivet attachment jigs and rivets from the same manufacturer, as the height of the attachment head according to DIN 7337 may vary.
- The clamping thickness results from the thickness of the material to be riveted plus an additional value of 2 mm to ensure that the closing head is perfectly formed. In accordance with this clamping thickness the corresponding shaft length is determined in the tables provided by the rivet manufacturers.

Important:

During riveting, many factors may have an influence on the exact tolerance of the rivets of 0.3 mm (e.g. rivet head tolerance). We therefore recommend that you make a test on a façade panel.

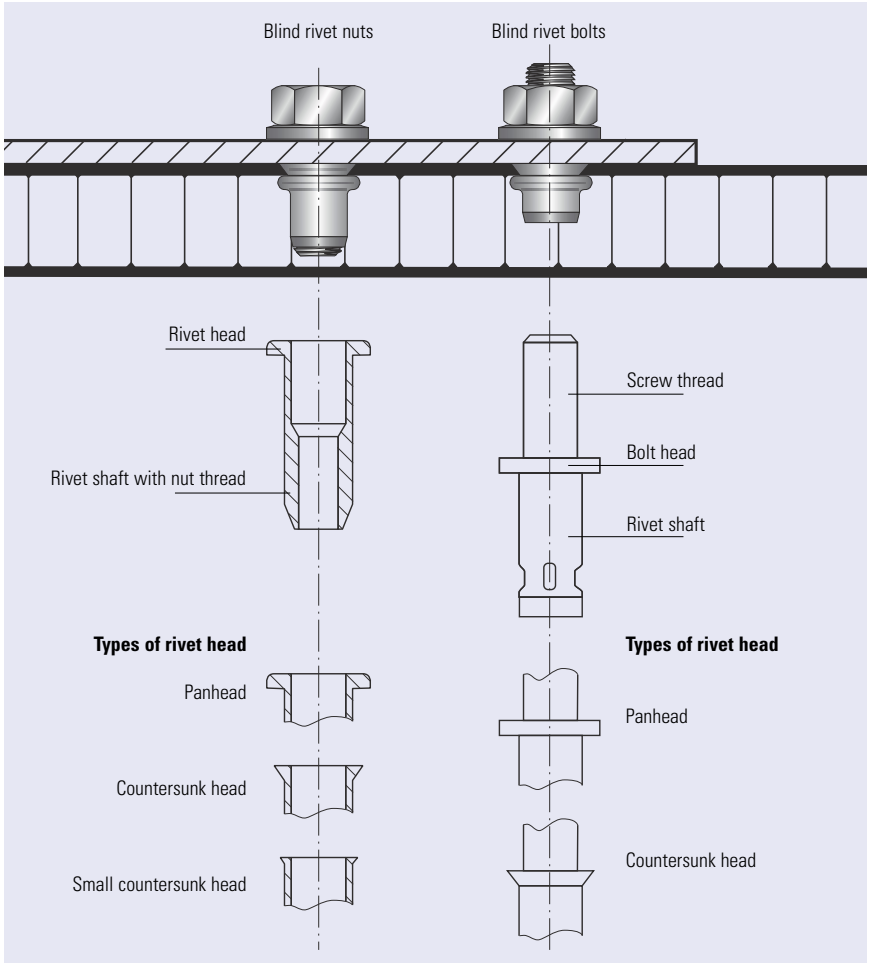
Please always remove the protective foil around the riveting area prior to riveting.

Blind rivet nuts and bolts

Blind rivet nuts and bolts are threaded elements performing the function of a blind rivet and a nut or bolt (screw).

There are various types of rivet head and materials which can be selected depending on the intended application. The blind rivet nuts or bolts are inserted in blind holes drilled in one side of the ALUCORE® panel. Subsequent fitting with a tool is fast and cost-effective.

Due to the minimum shaft length of 11 mm these fixtures can only be used for a panel thickness of 15 mm or more. As a rule, the rivet must be anchored in the 1 mm thick cover sheet.



Suppliers / Manufacturers:

Blind rivets

Commercially available or from

GESIPA-Blindniettechnik GmbH
Phone +49 61 05 962 0
Fax +49 61 05 962 287
www.gesipa.com

Gebr. Titgemeyer GmbH & Co. KG
Phone +49 541 58 22 0
Fax +49 541 58 22 490
www.titgemeyer.de

VVG-Befestigungstechnik GmbH & Co.
Phone +49 43 21 96 71 71
Fax +49 43 21 96 71 96
www.vvg-befestigungstechnik.de

Blind rivets lacquered

MBE GmbH
Phone +49 23 73 17 430 0
Fax +49 23 73 17 430 11
www.mbe-gmbh.com

SFS intec GmbH & Co. KG
Phone +49 61 71 70 02 0
Fax +49 61 71 70 02 46
www.sfsintec.biz

Plastic covers for rivets

HA-WI
Kunststoffe GmbH&Co.KG
Phone +49 27 54 37 450
Fax +49 27 54 81 19
www.ha-wi.de

Multi-step drills

KWO-Werkzeuge GmbH
Phone +49 73 26 96 42 0
Fax +49 73 26 96 42 10
www.kwo.de

Hole gauges

Please refer to blind rivets lacquered:
MBE GmbH

Rivet attachment jigs

Appropriate rivet attachment jigs are available from manufacturers or suppliers of rivets.

Manufacturer/Supplier:

Rivet nuts/bolts and appropriate tools

Alfred Honsel
Nieten- und Metallwarenfabrik GmbH & Co
Phone +49 2373 755 0
Fax +49 2373 755 600
www.honsel.de

Böllhoff GmbH
D-33649 Bielefeld, Germany
Phone +49 521 4482 05
Fax +49 521 4482 350
www.boellhoff.de

Gebr. Titgemeyer GmbH & Co. KG
Phone +49 541 58 22 0
Fax +49 541 58 22 490
www.titgemeyer.de

Gesipa-Blindniettechnik GmbH
Phone +49 6105 962 0
Fax +49 6105 962 287
www.gesipa.de


Tool for rivet nuts / bolts

Threaded fasteners

Threaded fasteners for outdoor use

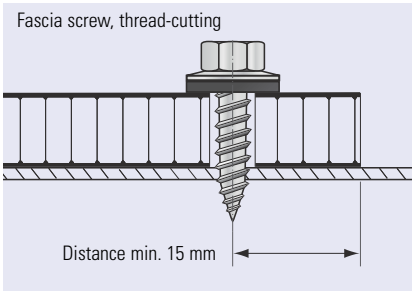
Please take the thermal expansion of the panel into account when using threaded fasteners outdoors. To avoid jamming, the hole diameter in the panel must allow for the expansion.

Fastening without jamming is possible with fascia screws made of stainless steel with sealing washer that have been approved for construction. The screws must be suitable for the corresponding substructure (please note the information given by the manufacturer). The screws should be tightened with a torque wrench or screw driver so that the sealing washer is placed on the panel for sealing the bore hole without exerting pressure onto the panel.

Multi-step drills or sleeves having corresponding diameters are used for centrically drilling holes into the panel and the substructure and for centrically fitting the rivet.

Important:

Please always remove the protective foil prior to screwing.



Suppliers / Manufacturers:

Fascia screws
EJOT Baubefestigungen GmbH
Phone +49 27 52 9 08 0
Fax +49 27 52 9 08 731
www.ejot.de

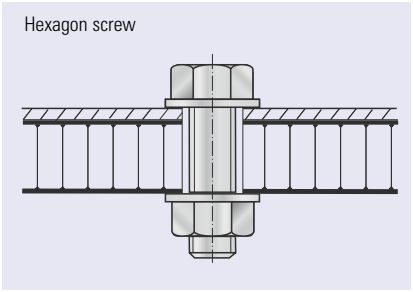
Fascia screws, lacquered
MBE GmbH
Phone +49 23 73 17 430 0
Fax +49 23 73 17 430 11
www.mbe-gmbh.com

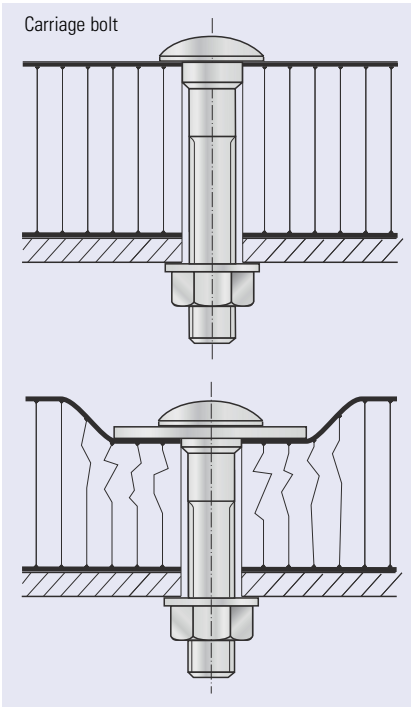
SFS intec GmbH & Co. KG
Phone +49 61 71 70 02 0
Fax +49 61 71 70 02 46
www.sfsintec.biz

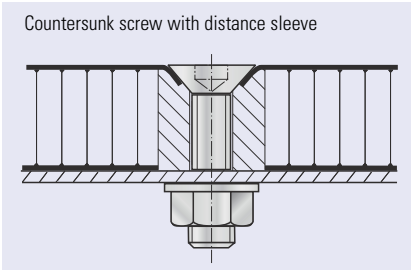
Multi-step drills (not available ex stock)
KWO-Werkzeuge GmbH
Phone +49 73 26 96 42 0
Fax +49 73 26 96 42 10
www.kwo.de

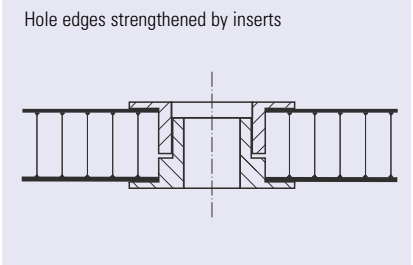
Hole gauges
please refer to fascia screws lacquered:
MBE GmbH

Examples of threaded fastener







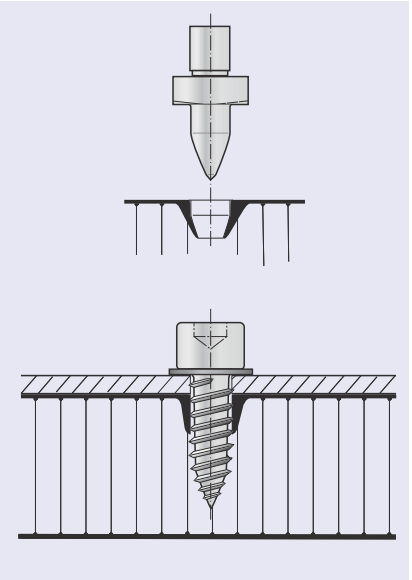


Flowdrill Process

Flowdrills are polygonally ground carbide-tipped tools.

The Flowdrill presses against the thin metallic material with a relatively high rotational speed and axial pressure. The generated heat makes the material soft enough to push the Flowdrill through the workpiece thus forming a hole. The material which is mainly displaced in process direction forms a bushing at the same time. The length of the bush can be 3 to 5 times the original material thickness.

In the case of threaded fasteners higher pull-out strength can be obtained due to the larger contact area of the screws.



The “flat/short” Flowdrill type is used for ALUCORE®. These drills are suitable for thin materials and remove protruding material from the panel surface at the same time.

Supplier for Flowdrill tools:

Flowdrill
Fließformwerkzeuge GmbH
Phone +49 6201 29 091 0
Fax +49 6201 29 091 15
www.flowdrill.com

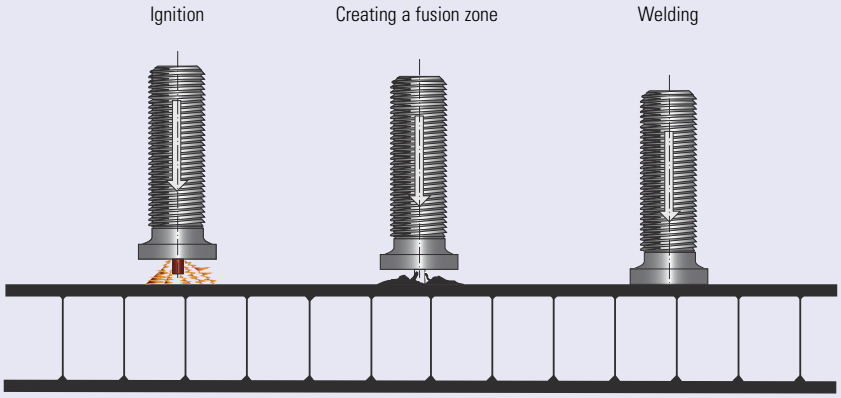
Stud welding with tip ignition on mill-finished ALUCORE® surfaces

By applying a force without the use of auxiliary material, studs and pin-type parts are welded to the carrier material by means of an electric arc.

Capacitor-discharge stud welding with tip ignition is suitable for ALUCORE® for sheets of a minimum thickness of 1 mm.

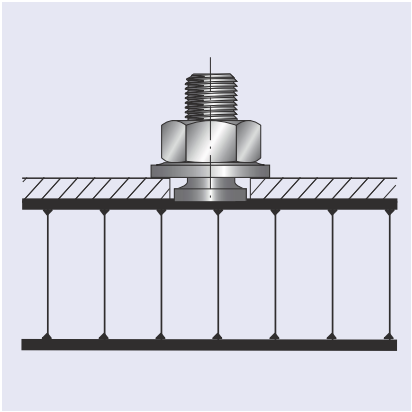
Studs and pins are used for various types of join.

Stud diameter: 3-8 mm
Material: AlMg Alloy



Process:

1. The capacitor battery is charged.
2. A spring in the welding gun moves the stud (with tip) towards the workpiece.
3. The tip comes into contact with the workpiece and thereby closes the circuit. The rapidly increasing current causes the ignition tip to melt instantaneously, thus initiating the electric arc.
4. Stud and workpiece are welded together.
5. When the stud touches the workpiece the electric arc is extinguished, the fusion zones on stud and workpiece are joined and solidify.



Owing to the highly dynamic process, the selection of the setting parameters is particularly important. The appropriate combination of the mechanical properties of the spring force and the air gap and the setting parameters of the capacity and the charging voltage is decisive for obtaining repeatable results.

Stud welding offers the following advantages:

- low thermal effect on stud and ALUCORE® panel
- fastening method without forming a hole, the panel is not weakened, sealed connection
- welding from one side without counter support
- suitable for cover sheets with a minimum thickness of 1 mm
- fast working cycle

Suppliers for stud welders and studs:

HBS Bolzenschweiß-Systeme
GmbH & Co.KG
Phone +49 8131 511 0
Fax +49 8131 511 100
www.hbs-info.com

Heinz Soyer
Bolzenschweißtechnik GmbH
Phone +49 8153 88 50
Fax +49 8153 80 30
www.soyer.de

Further suppliers:

www.schweissbolzen.de

www.i-vt.de

www.schmeck-schrauben.de

www.thomas-welding.com

Glueing

Tapes / velcro tapes

Double-sided tapes (such as the 3M-VHB high capacity jointing systems) can be used for the above applications with low tensile or transversal strength requirements. Velcro tapes are available for detachable joints, for example SCOTCHMATE or tapes marketed under the Dual Lock trademark.

3M Deutschland GmbH
Phone +49 21 31 14 0
Fax +49 21 31 14 34 70
www.3m.com

Adhesive sealing compounds

For high-strength and elastic connections we recommend the following one-component adhesive sealing compound:

Sika Bond-T2 (polyurethane base)
Sika GmbH
Phone +49 71 25 9 40 0
Fax +49 71 25 9 40 710
www.sika.de

For outdoor use, this adhesive can be used for fastening parts of minor static importance.

Metal adhesives / universal adhesives

For indoor use, trade fair/exhibition stand structures and machines, most metal or universal adhesives are suitable.

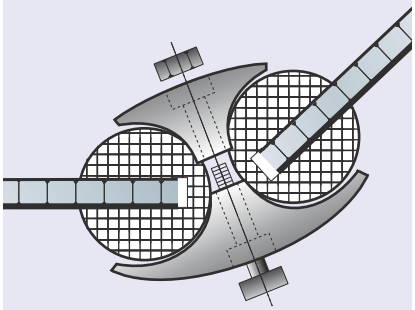
Important:

Please observe the manufacturer's instructions regarding the application and use of adhesives/tapes.

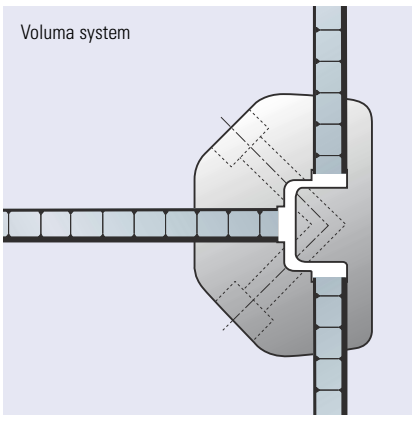
Laminating one side of ALUCORE® panels to other materials may result in deformation of the laminates (differing expansion/bimetal effect).

Clamp connections

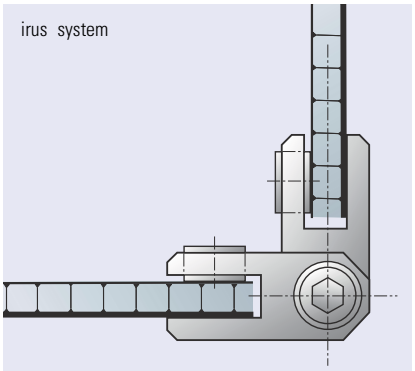
Klemetric system



Voluma system



irus system



Clamp connections incorporating aluminium or plastics are particularly suitable for ALUCORE®. They generally consist of two parts with the clamping effect achieved by bolting.

Various designs of clamping element are used for display and store fitting purposes (no outdoor use).

Supplier:

Klemetric system :
KlemProducts®
Gesellschaft für Werbemittel mbH
Phone +49 89 857 72 80
Fax +49 89 895 83 48
www.klemproducts.com

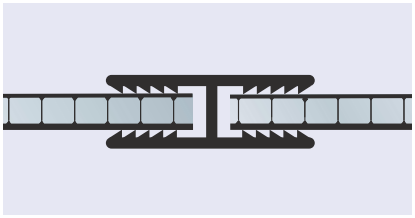
Voluma system :
MERO Raumstruktur GmbH & Co.KG
Ausstellungssysteme
Phone +49 931 66 70 571
Fax +49 931 66 70 189
www.mero.de

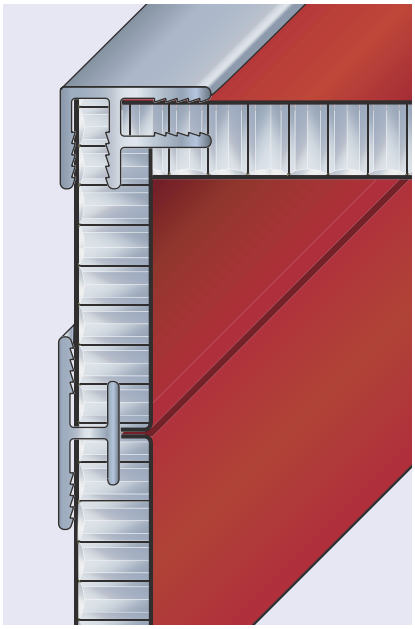
Irus system :
Irus-System
Phone +49 77 02 36 85
Fax +49 77 02 90 45
www.irus-system.com

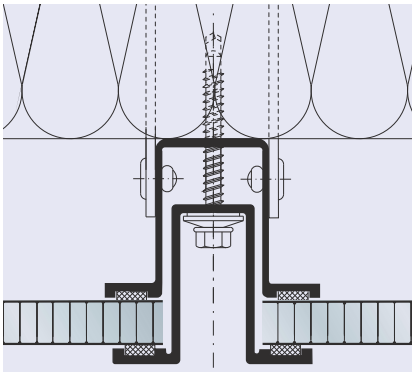
Any suitable connection or shock-resistant frame can easily be made with aluminium sections.

For fascia cladding applications special aluminium sections are provided for clamp connections.

For further information on ALUCORE® special sections and types for fascia claddings please ask for the respective documentation.







Surface treatment / printing

Overlacquering of stove-lacquered ALUCORE® surfaces of polyester lacquer quality (panels not exposed to weather conditions)

Aluminium treatment and priming carried out at the factory in a continuous process with continuous quality control is advantageous to the overlacquering of the stove-lacquered ALUCORE® surface.

ALUCORE® overlacquering procedure

- Pre-cleaning of the panels using methylated spirit
- Grinding the surfaces with wet abrasive paper (grain size 360)
- Removing grinding dust with a lintfree cloth moistened with spirit
- For the top coat, please follow the instructions of the top coat supplier

Please note:

- **The maximum permissible temperature of the material (ALUCORE® panels) must not exceed 70° C when applying fast-drying methods. During the drying process at high temperatures the ALUCORE® panels must be positioned with great care to prevent deformation.**
- ALUCORE® cut edges should not be in contact with organic solvents for a prolonged period of time to avoid weakening of the bond.
- ALUCORE® panels lacquered or overlacquered at a later stage should not be bent or folded. The lacquer in the bends or folds may be damaged due to the low elasticity of the top coat.
- Please make a test prior to overlacquering and follow the instructions of the lacquer suppliers.

Lacquering of mill-finish ALUCORE® surfaces

The composition of lacquer coating for mill-finish ALUCORE® is basically the same as for mill-finish aluminium surfaces. However, it is advisable to be familiar with coating systems and materials as well as working methods for aluminium.

Additional information

- For general information on painting, lacquering and coating of aluminium we recommend leaflets on „02, 03, 012, 015 surfaces" issued by

  Gesamtverband der Aluminiumindustrie e.V. (GDA)
  www.aluinfo.de

Screen printing on ALUCORE® surfaces in polyester lacquer quality

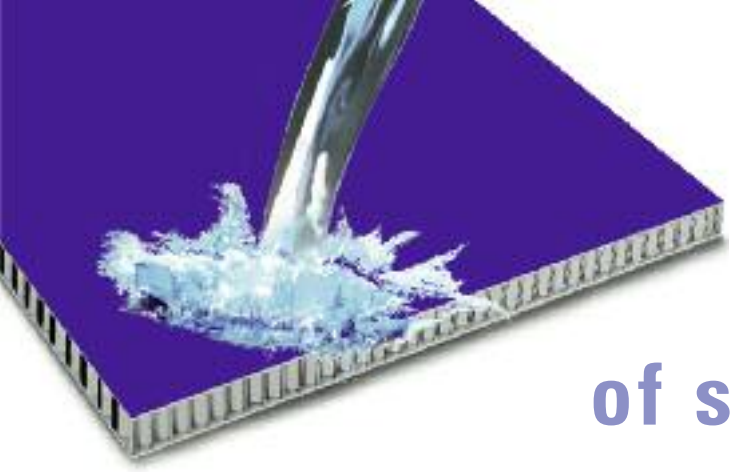
Stove-lacquered ALUCORE® panels are well suited for screen printing.

Prior to printing, please make sure to remove the protective foil and clean the surface with a lintfree cloth moistened with ethyl or isopropyl alcohol. The alcohol must not be poured directly onto the panel. The lacquer coat can be damaged by the use of methylated spirit. About 10 to 15 minutes should be left between cleaning and printing.

Practice has shown that even within a given specification of stove-lacquer paint and printing ink there may be variances, and in view of this it is recommended that in the case of each particular application the adhesion properties of the selected printing ink should be tested.

Laminating

ALUCORE® can be laminated (manually or by machine) with cast or calendered self-adhesive foils. The varnish does not come off when changing the foils.



Cleaning and maintenance of stove-lacquered surfaces

Expert and regular cleaning not only maintains the aesthetic and representative finish of stove-lacquered surfaces but also maintains their quality through the removal of dirt and aggressive deposits.

Cleaning intervals depend on local environmental conditions and the resulting amount of soiling.

Surfaces should be cleaned either manually or with a suitable cleaning device from top to bottom.

Please do not use any abrasive pads on lacquered surfaces. We recommend that the cleaning agent be tried on an unobtrusive part of the object to be cleaned to check whether the surface is affected.

Do not clean hot surfaces (> 40° C) as the quick drying process may cause blemishes.

Cleaning agents

A list of neutral cleaning agents for organically coated or anodized aluminium components is available at

Gesamtverband der Aluminiumindustrie e. V. (GDA)
Phone +49 211 47 96 268
Fax +49 211 47 96 408
www.aluinfo.de

Please observe the manufacturer's cleaning and safety instructions!

For further information such as addresses of approved and recommended cleaning companies, please contact

Gütegemeinschaft für die Reinigung von Metallfassaden e.V. (GRM)
Phone +49 71 71 10 40 845
Fax +49 71 71 10 40 850
www.grm-online.de

Non-suitable cleaning agents

Please do not use any powerful alkaline cleaning agents such as potassium hydroxide, soda, caustic soda or any powerful acidic products or heavily abrasive scouring agents such as Vim, Ajax, Imi or lacquer-dissolving cleaning agents.

ALUCORE®

Technical Data Sheet

Thickness:			6 mm	10 mm	15 mm	20 mm	25 mm
Cover sheet thickness, front		[mm]	1.0			1.0	
Cover sheet thickness, rear		[mm]	0.5			1.0	
Weight		[kg/m²]	4.7	5.0	6.7	7.0	7.3
Technical properties:							
Section modulus	W	[cm³/m]	2.5	4.5	13.1	18.1	23.1
Rigidity	E·I	[kNcm²/m]	7,100	21,900	75,500	138,900	221,600
Alloy of cover sheets			Peraluman alloy (AlMg)				
Modulus of elasticity		[N/mm²]	70,000				
Surface:			Coil coating systems:				
Standard lacquering: both sides platinum white			Special polyester lacquer				
For fascia application:			Fluorocarbon based (e.g. PVDF)				
Gloss (initial value)		[%]	30 - 80				
Pencil hardness			HB - F				
Acoustical properties:							
Sound absorption factor	α_s				0.05		
Airborne sound insulation index (according to ISO 717-1, ISO 140-3)	R_w	[dB]	21	21	22	23	25
Thermal properties:							
Thermal conductivity (regarding total thickness, incl. cover sheets)	λ*	[W/mK]	0.95	1.35	1.78	2.25	2.70
Thermal resistance	R	[m²K/W]	0.0063	0.0074	0.0084	0.0089	0.0093
Linear heat transition coefficient			2.4 mm / m at 100°C temperature difference				
Temperature resistance		[°C]	-40 up to +80				

Information

(please ask for the additional documentation on)

ALUCORE®	Product Information Folder
ALUCORE®	The Colours
ALUCORE®	Documentation File
ALUCORE®	CD ROM

Samples

Original samples with standard surfaces

ALUCORE®

2/09/10 ALUCORE® Processing GB

www.alucore.com

3A Composites GmbH
78224 Singen, Germany
Phone +49 (0) 7731 80340
Fax +49 (0) 7731 803803
info.eu@alucore.com