



FAÇADE GUIDE
RIVETED & SCREWED



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ALPOLIC™ COMPOSITE PANELS & SUBSTRUCTURE

ALPOLIC™ composite panels



ALPOLIC™ /fr

Width: 1,035 | **1,285** | **1,535** | 1,785 | 2,050mm (± 2mm)
Length: max. 7,300 (±1mm/m)
Weight: 7.6kg/m²
Fire-retardant core
Fire Class B - s1, d0*

ALPOLIC™ A2

Width: 1,000 | **1,250** | **1,500** | 1,750 | 2,015mm (± 2mm)
Length: max. 7,300 (±1mm/m)
Weight: 8.4kg/m²
Non-combustable core (Limited-combustable in UK)
Fire Class A2 - s1, d0*

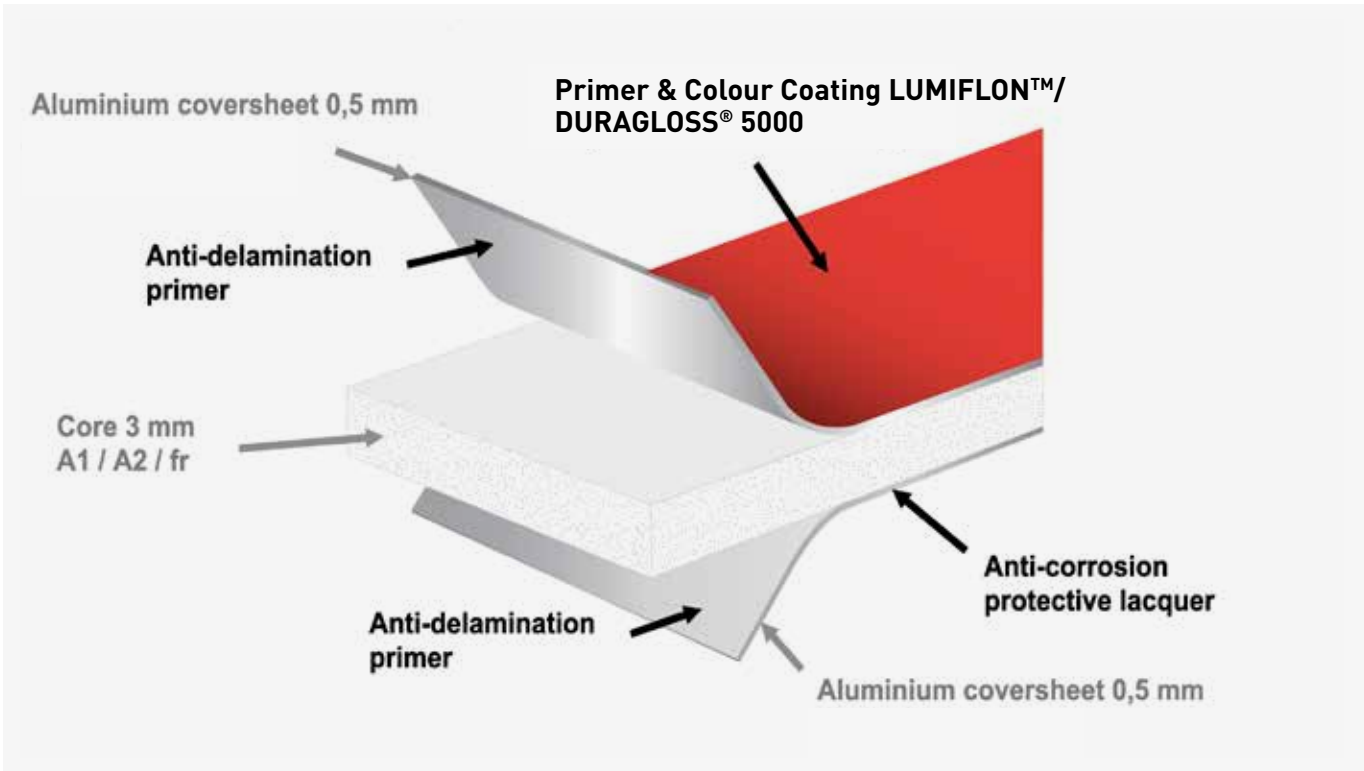
ALPOLIC™ NC/A1

Width: **1,250** | **1,500mm (± 2mm)**
Length: max. 7,300 (±1mm/m)
Weight: 8.6kg/m²
Non-combustable core
Fire Class A1*

*according Euronorm EN13501-1

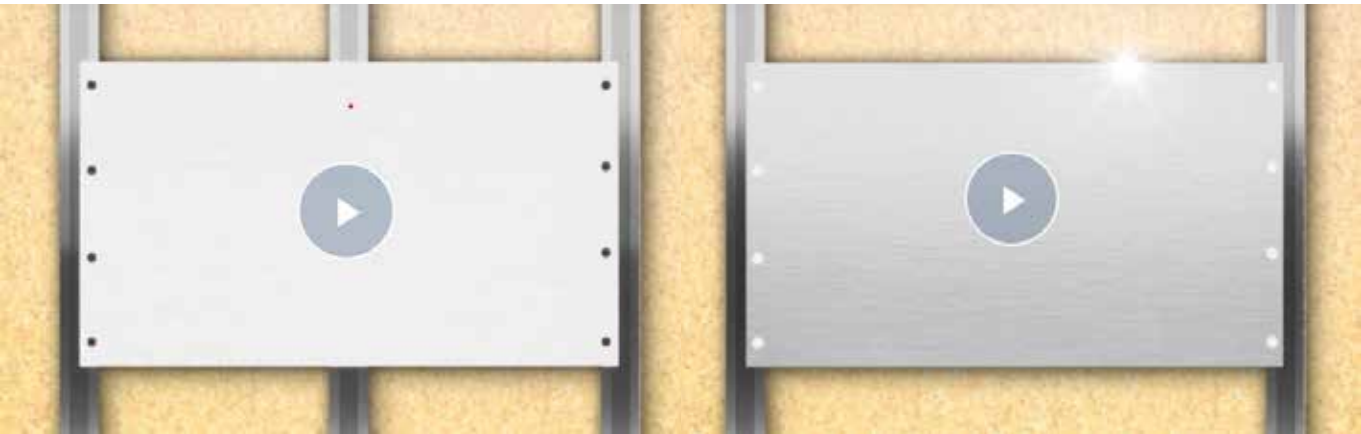
Panel performance

ALPOLIC™ panels have marine quality as a standard, due to the protection coatings and primers.



Substructure

ALPOLIC™ panels can be used with bigger span between substructures, due to the panel strength.



Standard solution

ALPOLIC™ solution

Benefit using ALPOLIC™ panels:

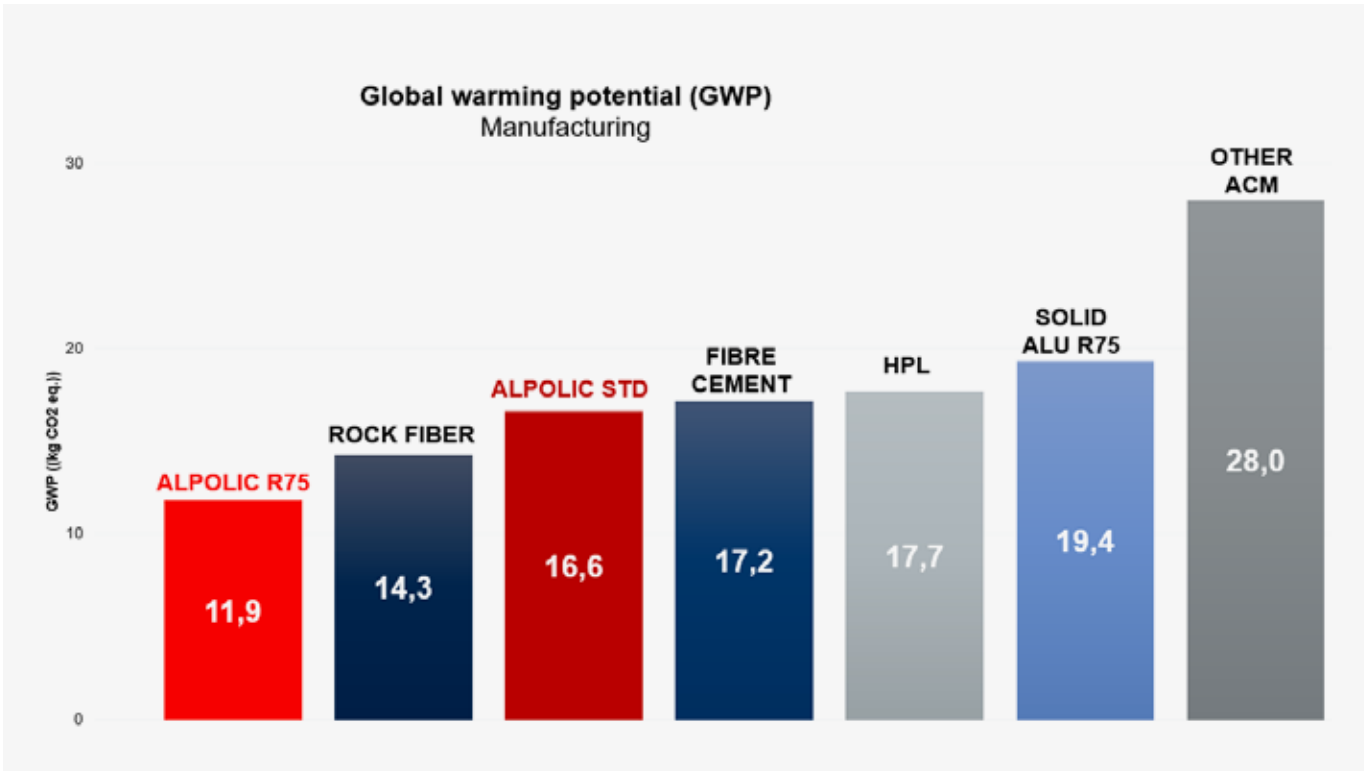
- Up to 20% less insulation material necessary to get the same U-value
- Up to 50% less substructure required for the same panel size
- Up to 50% less installation time
- Up to 50% less CO₂ emission due to the material savings
- Up to 23% energy saving on the building in service, less energy consumption in summer and winter



Sustainability performance

- Durability: Up to 70 years service life
- Low maintenance
- Reusable or almost 100% recyclable
- Up to 75% recycled aluminium content

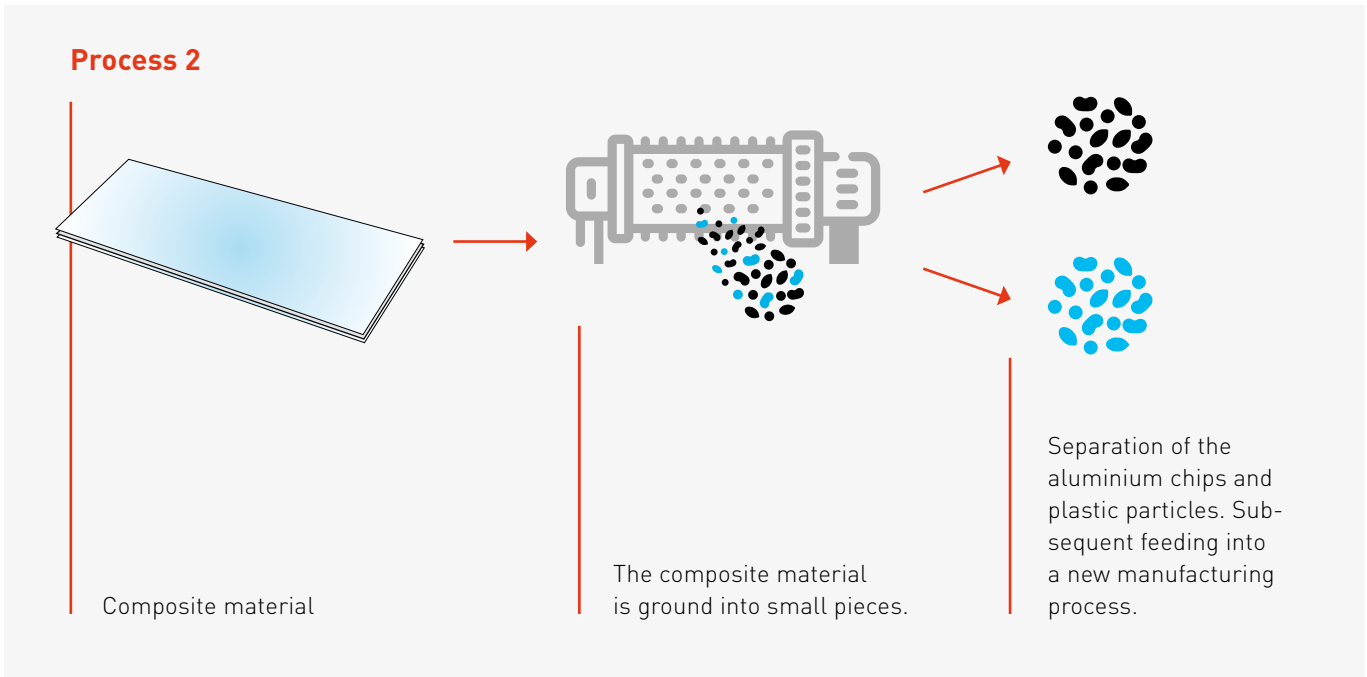
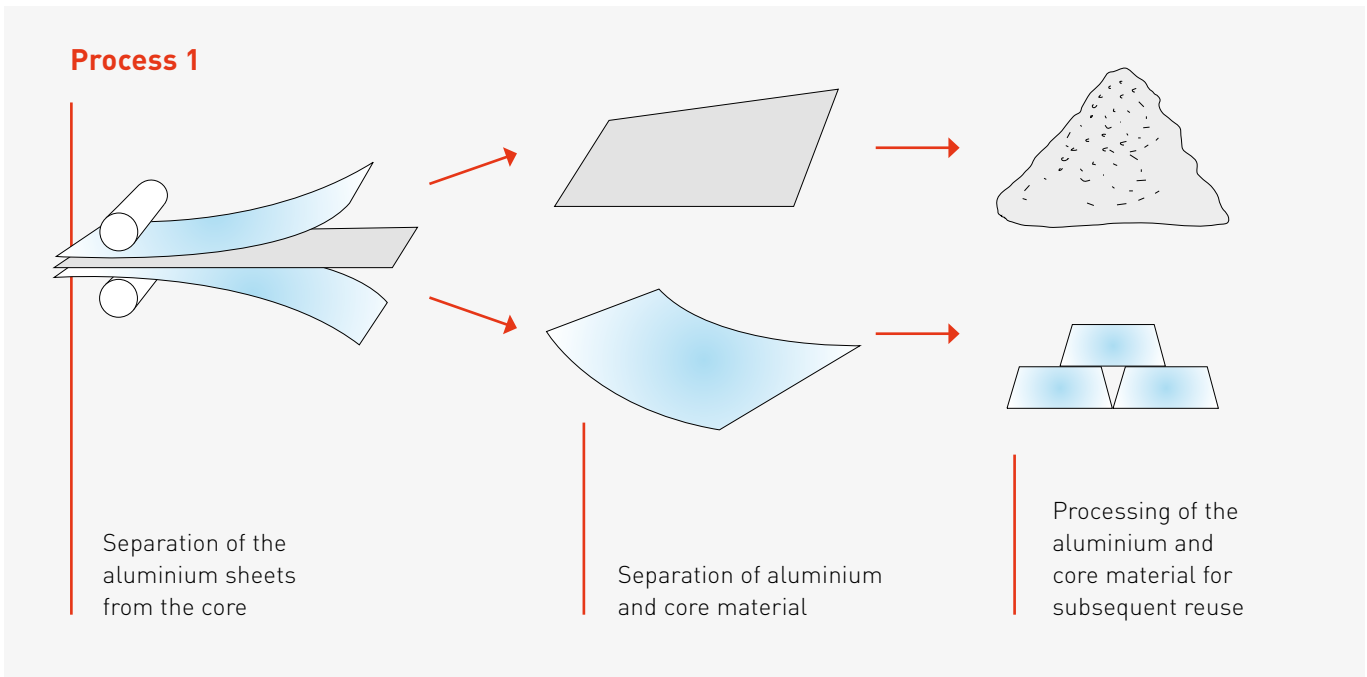
Comparison of the carbon footprint:



Recycling process

These are 2 ways to recycle panels:

- **Process 1:** recycling the panels on building site at the end of life (big parts)
- **Process 2:** recycling the waste from fabrication (small parts)



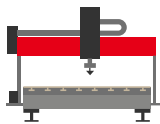
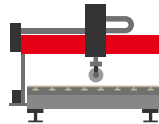
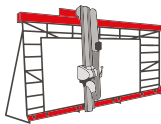
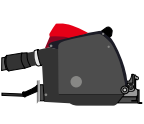
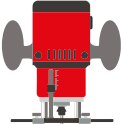
Link to Recycling Centers:
<http://www.wert-recycling.de>
<http://www.grafenberg-metall.com/>
<http://darmetall.de/>

CUTTING & MILLING

Cutting and Milling tools

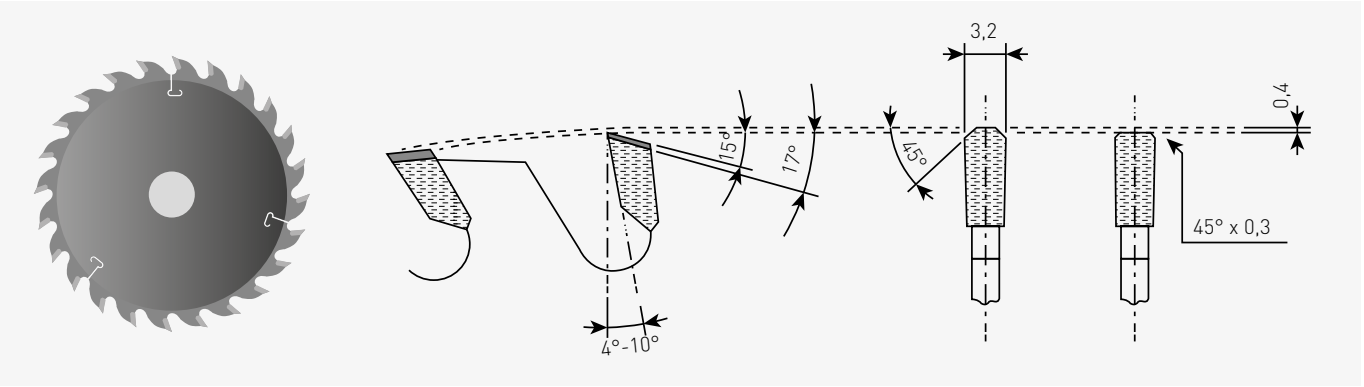
ALPOLIC™/fr: can be processed using a variety of tools, such as a hand router, sheet milling machine, panel saw or CNC machine.

ALPOLIC™ A2 & A1: CNC machines are suitable for cutting and milling.

	CNC			Vertical panel saw		milling machine	Router
							
Router/Cutter							
ALPOLIC™/fr	✓	✓	✓	✓	✓	✓	✓
ALPOLIC™ A2	✓	✓	✓	✗	✗	✗	✗
ALPOLIC™ A1	✓	✓	✓	✗	✗	✗	✗
Rotation speed (rpm)	18,000 – 20,000	2,000 – 4,000	2,500 – 5,000	2,000 – 4,000	2,500 – 5,000	5,000 – 9,000	20,000 – 30,000
Feed speed (m/min)	5 – 8 (fr) 3 – 4 (A2 & A1)	30	30	30	30	5 – 20	3 – 5
Number of teeth	1	80 – 100	8 – 12	80 – 100	8	4 – 6	2 – 4

Panel cutting

Carbide or diamond saw blade for **ALPOLIC™/fr & A2** / diamond for **ALPOLIC™ A1**, trapezoidal/flat teeth, positive rake angle (+4° à +10°).

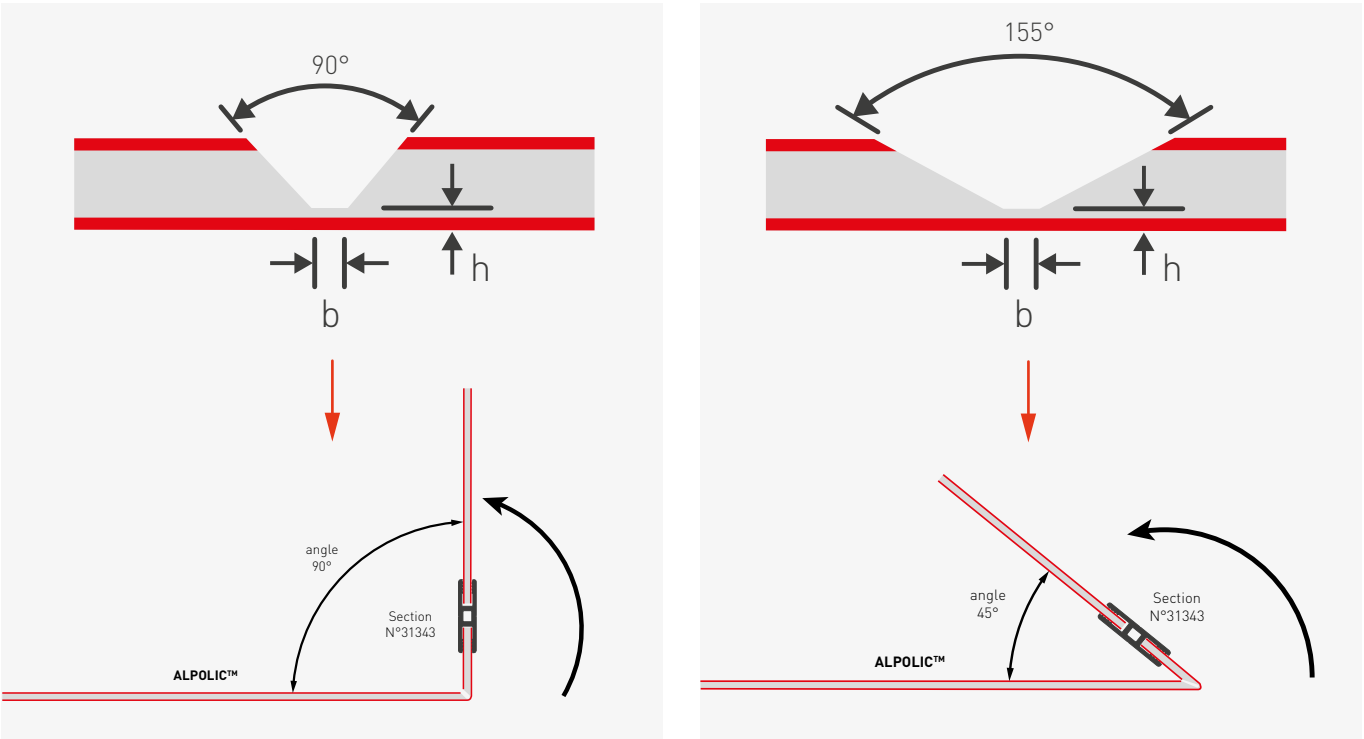


Suppliers: AKE, Bayerwald, Leuco

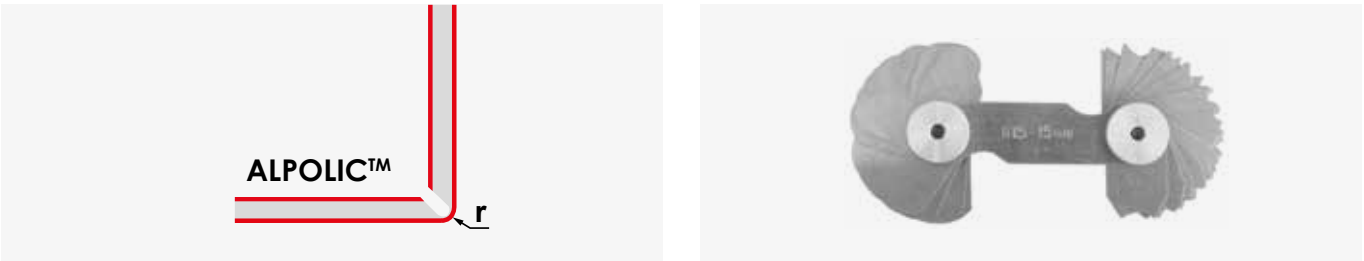
Milling parameters

Each type of ALPOLIC™ panel has a different milling geometry.

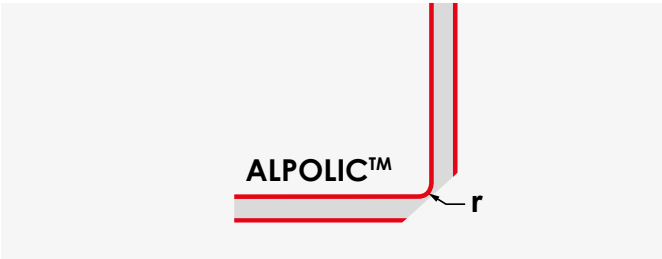
Panel	b (mm)	h (mm)	Core left (mm)	Bending radius r (mm)	Milling tool
ALPOLIC™/fr	3	0.7 – 0.9	0.2 – 0.4	2 – 3	Carbide/Diamond
ALPOLIC™ A2	3 – 4	0.65 – 0.75	0.15 – 0.25	1.5 – 2	Diamond
ALPOLIC™ A1	3 – 4	0.55 – 0.65	0.05 – 0.15	1.5 – 2	Diamond



Check the bending radius after folding with a radius gauge (respect the **r** values above)



If the bend is made in the opposite direction (e.g. inside corner), it is not possible to use the panel with the realAnodised finish.



CUTTING & MILLING

Finger cutters

Carbide or Diamond for **ALPOLIC™/fr & A2** / diamond for **ALPOLIC™ A1**

V-90° - Ø6–12mm
V-155° - Ø6–12mm

Single flute cutter with right-hand twist, upcut, polished – Ø4–8mm

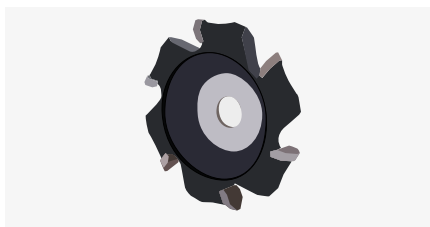
Suppliers: AKE, Crown Norge, Gis-Tec, Leitz, Affutage du Xaintois ,
GOLD Werkzeugfabrik GmbH



Saw blades for milling and folding technique

Carbide for **ALPOLIC™/fr**, diamond for **ALPOLIC™ A2 & A1**

Suppliers: AKE, Leuco, Leitz, Affutage du Xaintois, Festool, Mafell, Makita



Hand machines for milling and folding technique

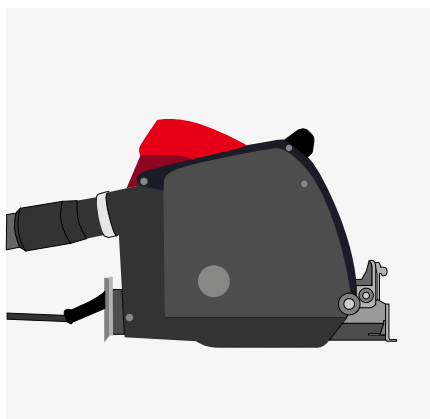
Sheet milling machine with minimum rating 800 W.

ALPOLIC™ panels can be easily grooved using an edge milling machine.
Use wooden or plastic spacers to avoid clamping marks on the cover plates.

Sheet milling machine PF 1200 E-Plus from Festool
with removable distance roller (automatic depth setting)

Sheet milling machine MF 26 cc from Mafell
with adjusting screw (manual depth setting)

Sheet milling machine CA5000XJ from Makita
with adjusting screw (manual depth setting)



Dust extractor

Mobile dust extractors, types CTM approved for dust class M for dust with MAK values > 0.1 mg/m³ for sheet milling machines,
hand routers and hand-held circular saws.

DRILLING

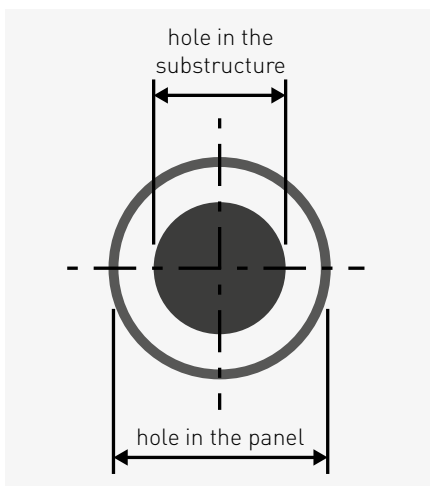
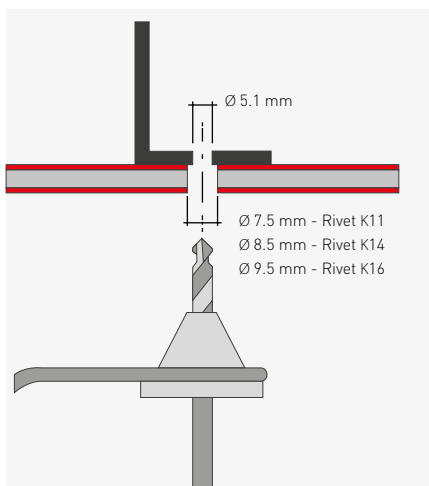
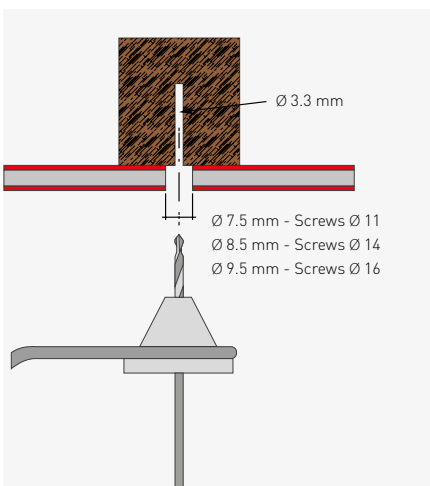
Pre-drilling of the substructure

For the rivets or screws to be centered in the panel hole, the use of a drill with a center point or a drilling jig is recommended.

Pre-drilling of the substructure:

- Screwed on wood : Ø3.3mm
- Riveted on aluminium substructure: Ø5.1mm
- Screwed on aluminium substructure: no need

The local regulations for the substructure must be checked before installation near the sea.



Drilling bits

The following drills are particularly suitable:

- Drilling bit DEWALT with centring tip, Extreme 2TM
- Drilling bit DEWALT HSS Cobalt DIN 338
- Drilling bit HSS with centring tip Ø5.1mm (to drill substructure)
- Drilling bit HSS with centring tip Ø7.5mm, Ø8.5mm, Ø9.5 mm & Ø10mm (to drill **ALPOLIC™** panel)
- Drilling bit Hilti HSS

Drilling jigs

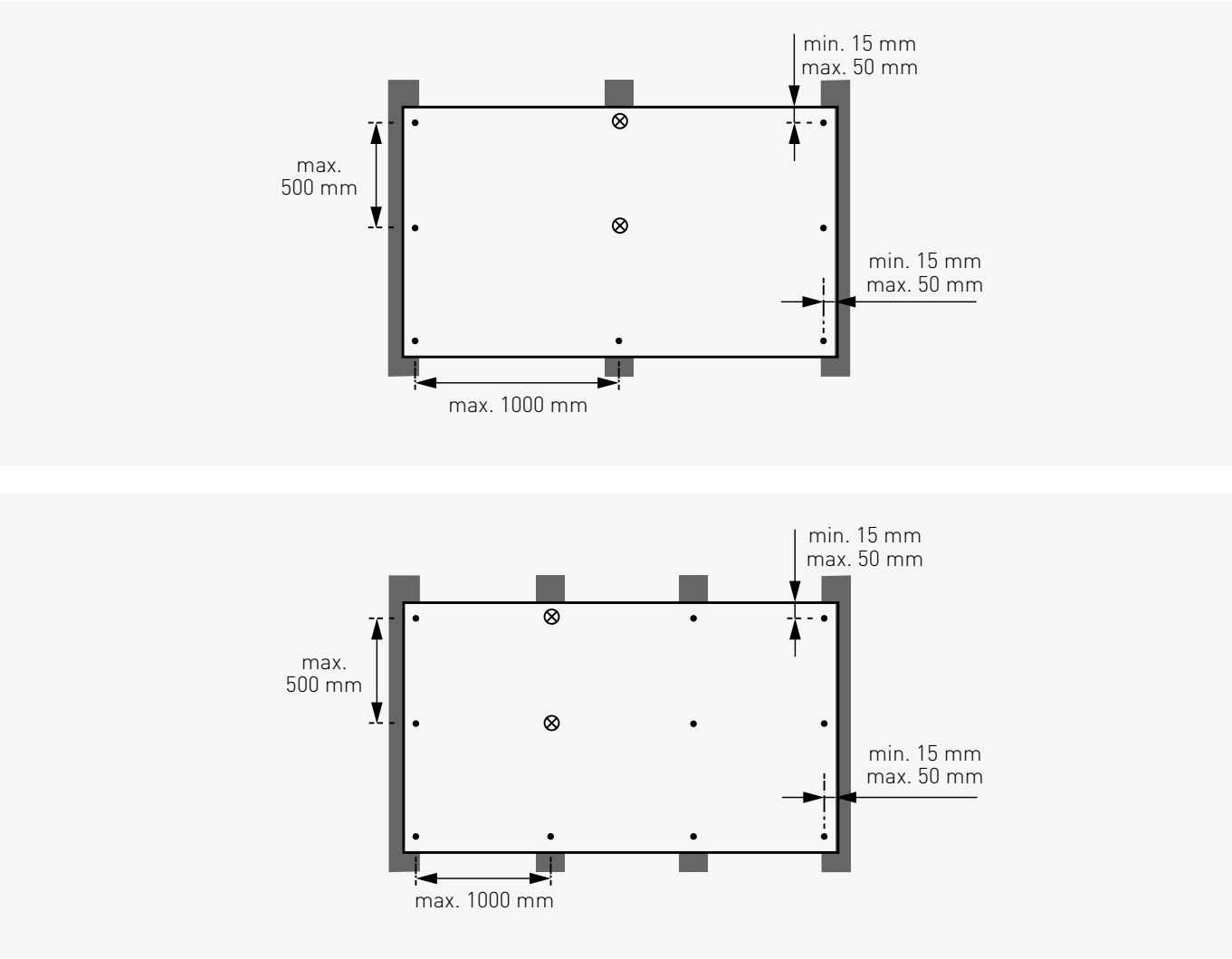
Handle drill-jig (for aluminium Ø8.5mm, Ø9.5mm and Ø10mm, for wood Ø3.3mm.

e.g.: SFS, Etanco, Hilti, EJOT



DRILLING

Drilling of the panel



- ⊗ Fixed point (drilling Ø6mm)
- Sliding point (drilling Ø7.5mm for a rivet K11, Ø8.5mm for K14, Ø9.5mm for K16)

To position the panel, it is recommended that 2 fixed points with 6mm diameter holes are provided for a 5mm diameter pin (see figures above). The distance between the fixed points must be limited to avoid constraint in the event of significant thermal expansion.

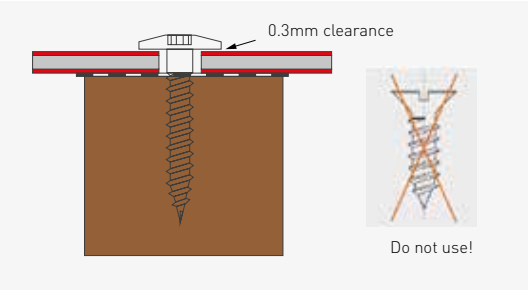
The drilling diameter of the fixed points must be chosen taking into account the thermal expansion, allowing the movement of the panel according to the temperature variations, without restricting it (see table above). Please note that the hole clearance is between 1.0 mm and 4.5 mm depending on the diameter of the rivet/screw head. The fastening elements should be centred in the drilled holes.

SCREWING & RIVETING

Screwing

We recommend the use of approved stainless steel screws (Check ETA approval of screw suppliers and ALPOLIC™). The screws must be suitable for the corresponding support (follow the manufacturer's instructions). The screws must be installed unconstrained, e.g. using a cordless screwdriver with a depth stop: 0,3mm clearance between the panel and the substructure. Some screws stop automatically at the correct depth.

- For example:
- FEIN-ASCS 18-6.3 Select+
 - Hilti_ST 1800-A22

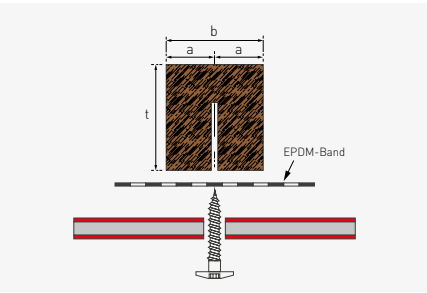


Façade screws for ALPOLIC™ panels on wood substructure

Brand	Ref.	approval		metal	screw head		type	body Ø
					thick. mm	Ø mm		
SFS	TW-S-D12	x	x	A2	2.5	12	T20W	4.8
EJOT	JA3-LT-D12	x	x	A2	2.2	12	T20	4.8
MBE	FA 4,8x30 K16	x	✓	A2	2.7	16	T20	4.8
ETANCO	PANEL BOIS D12	x	x	A2	2.5	12	T20	4.8
ETANCO	PANEL BOIS D16	x	x	A2	2.2	16	T20	4.8

Minimum dimensions of the wooden strips according to DIN 1052.

Façade screw	Pre-drilled
Wooden strip thickness t	≥ 40mm
Distance from edge a	≥ 20mm
Wooden strip width (intermediate) b	≥ 60mm
Wooden strip width (lateral) b	≥ 100mm



Remove the protective film from around the holes before screwing.

Façade screws for ALPOLIC™ panels on aluminium substructure

Brand	Ref.	approval		metal	cut protect film	depth stop mm	clamping capacity mm	screw head		type	body Ø
								thick. mm	Ø mm		
SFS	SX3-15-D16	✓	x	A2	x	x	5-15	2.5	16	T25W	5.5
SFS	SLA3_6-D16	✓	x	A2	x	✓	6	2.5	12	T25W	5.5
EJOT	JT3-LT_D16	✓	x	A2	x	x	5-15	2.0	16	T25	5.5
EJOT	JT3-LT_D12	x	x	A2	x	x	5-15	2.0	12	T25	5.5
EJOT	JT4-LT_D16	✓	✓	A2	x	x	5-12	2.0	16	T25	5.5
EJOT	JT4-FR_D12	x	x	A2	x	✓	6	2.0	12	TX25	4.8
EJOT	JT4-XT_D12	x	x	A2	✓	✓	6	2.5	12	TX25	4.8
ETANCO	DRILLNOX	x	x	A2	x	x	5-16	2.5	12	T20	5.5
ETANCO	PANEL3 ALU	x	x	A2	x	x	5-16	2.5	12	T20	4.8
ETANCO	PANEL3 ALU P3	x	x	A2	x	✓	6.5-7	2.5	12	T20	4.8

At a distance of less than 1.6 km from the sea, A2 stainless steel screws with a plastic ring must be used.



SCREWING & RIVETING

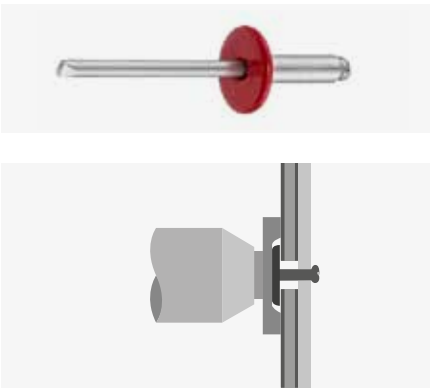
Riveting

We recommend the use of approved aluminum blind rivets, with stainless steel mandrel and Ø5mm shank, with a rivet head of Ø11mm, 14mm, or 16mm (K11, K14, K16). The rivet head should overlap the edge of the hole by at least 1mm.

 **Less than 1.6 km from the sea, A2 stainless steel rivets head with plastic ring have to be used.**

Using suitable jigs (rivet nose), the blind rivets must be fitted without compression, with a clearance of 0.3mm. Rivets and jigs must come from the same manufacturer.

Before riveting, remove the protective film around the holes.



Facade rivets for ALPOLIC™ panels on aluminium substructure

Brand	Ref.	approval		metal	clamping capacity	rivet head		body Ø mm
						thick.	Ø	
						mm	mm	
SFS	AP11_S_5x12	x	✓	alu/SS	4-8	1.5	11	5.0
SFS	AP14_S_5x12	x	✓	alu/SS	4-8	1.5	14	5.0
SFS	AP16_S_5x12	x	✓	alu/SS	4-8	1.5	16	5.0
SFS	SS0-D15-S-5x14	x	x	A4	6-9.5	1.5	15	5.0
IPEX	IPEX K11 4.8x12	x	✓	alu/SS	4-8	1.5	11	4.8
IPEX	IPEX K14 4.8x12	x	✓	alu/SS	4-8	1.5	14	4.8
IPEX	IPEX K16 4.8x12	x	✓	alu/SS	4-8	1.5	16	4.8
EJOT	ECORIV 5x12 K14	x	x	alu/SS	4-8	1.5	14	5.0
ETANCO	RIVCOLOR	x	x	alu/SS	4-8	1.5	14	5.0



Rivet nose

Special rivet nose for Ø11mm, Ø14mm & Ø16mm.
E.g.: SFS, EJOT, Etanco

Suppliers

SFS Division Construction Rosenbergsaustasse 10 CH-9435 Heerbrugg Tel. +41 71 727 51 51 https://de.sfs.com/	EJOT Germany In der Stockwiese 35 D-57334 Bad Laasphe Tel. +49 2752 908-0 www.ejot.de	Etanco France ZI – Rue du Clos Reine – BP 60073 F - 78410 Aubergenville Tel: +33 1 34 80 52 00 www.etanco.fr	SFS Group Germany GmbH MBE Menden Siemensstr. 1 58706 Menden Tel.: +49 2373 17430-0 https://www.mbe-menden.de/
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Screwing and riveting without constraint

- To avoid stress at the fasteners, rivets or screws should be fastened without constraint
- The holes in the panels must be sized according to the calculated thermal expansion, depending on the size of the panels and the colour
- Linear thermal expansion is 1.9 to 2.4 mm per meter of panel length per 100°C temperature difference [from 1,9 to 2,4 mm/m/100°C]

Panel	Thermal expansion factor for 1°C	Expansion in mm/m, for ΔT 50°C
ALPOLIC™/fr	24 x 10 ⁻⁶	1.2 mm/m
ALPOLIC™ A2	19 x 10 ⁻⁶	1.0 mm/m
ALPOLIC™ A1	21 x 10 ⁻⁶	1.1 mm/m

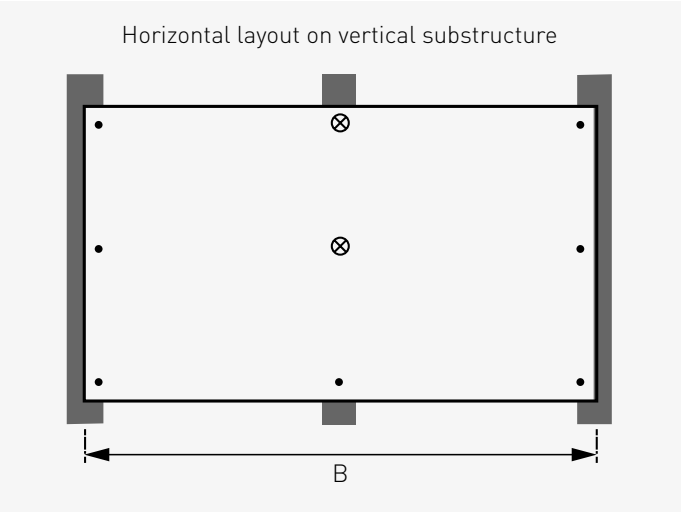
Example:

- Maximum temperature in the summer for a black panel **ALPOLIC™ A2** → 80°C
- Installation temperature → 20°C
- Panel length (horizontal) → 2,000 mm

The calculation of thermal expansion is: ΔL = 19 x 10⁻⁶ x (80-20) x 2,000 = 2.25 mm

DETERMINATION OF THE RIVET HEAD SIZE

Choosing the rivet according to the panel colour & length

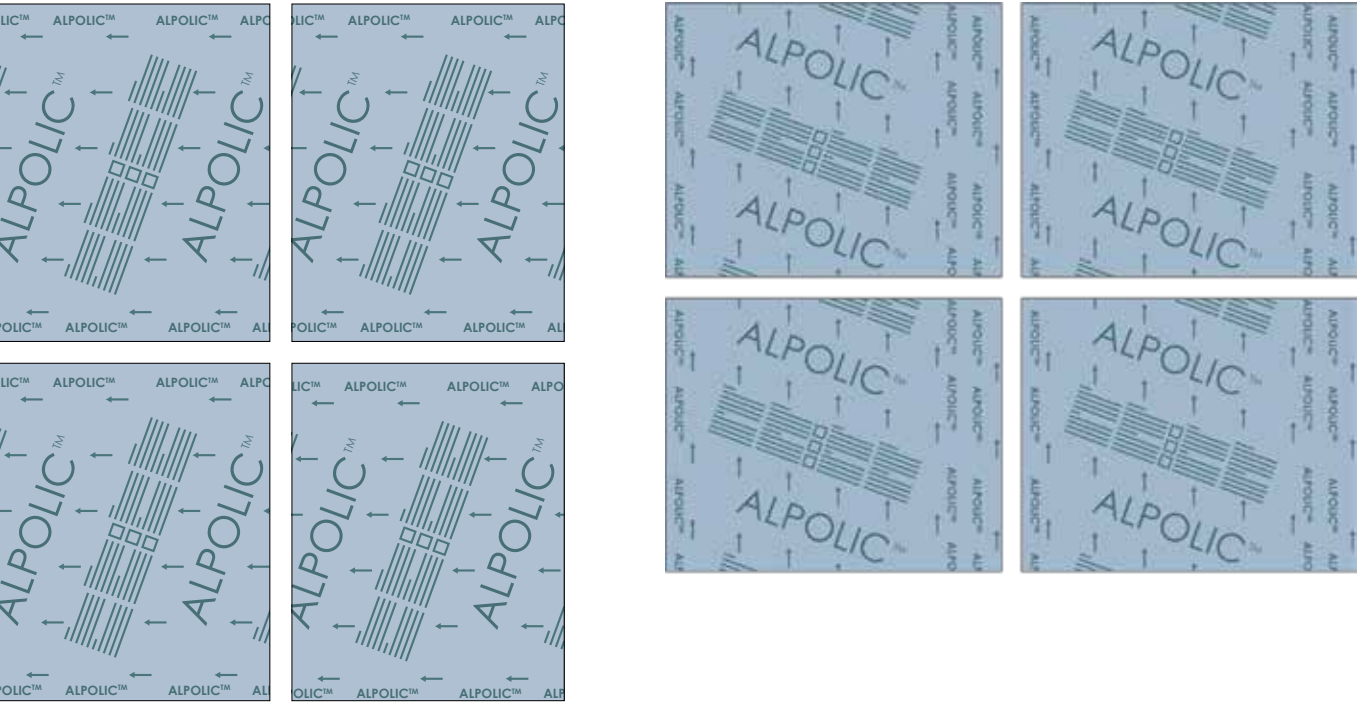


RAL	T° max	T° installation	min. diameter of the rivet/screw head																		
9001	40°	10°	K11	K11	K11	K11	K11	K11	K11	K11	K11	K11	K11	K14	K14	K14	K14	K14	K16	K16	
		20°	K11	K11	K11	K11	K11	K11	K11	K11	K11	K11	K11	K11	K11	K11	K11	K11	K11	K11	
1015	50°	10°	K11	K11	K11	K11	K11	K11	K11	K11	K11	K14	K14	K14	K14	K16	K16	K16	K16		
		20°	K11	K11	K11	K11	K11	K11	K11	K11	K11	K11	K11	K14	K14	K14	K14	K14	K14	K16	K16
1004	51°	10°	K11	K11	K11	K11	K11	K11	K11	K11	K14	K14	K14	K14	K16	K16	K16	K16			
		20°	K11	K11	K11	K11	K11	K11	K11	K11	K11	K11	K11	K14	K14	K14	K14	K14	K14	K16	K16
1007	55°	10°	K11	K11	K11	K11	K11	K11	K11	K14	K14	K14	K14	K16	K16	K16	K16				
		20°	K11	K11	K11	K11	K11	K11	K11	K11	K11	K11	K14	K14	K14	K14	K14	K16	K16	K16	K16
2002	62°	10°	K11	K11	K11	K11	K11	K11	K14	K14	K16	K16	K16	K16							
		20°	K11	K11	K11	K11	K11	K11	K11	K11	K14	K14	K14	K14	K14	K16	K16	K16	K16		
3000	63°	10°	K11	K11	K11	K11	K11	K11	K14	K14	K14	K16	K16	K16							
		20°	K11	K11	K11	K11	K11	K11	K11	K11	K14	K14	K14	K14	K16	K16	K16	K16			
3003	68°	10°	K11	K11	K11	K11	K11	K14	K14	K14	K16	K16	K16								
		20°	K11	K11	K11	K11	K11	K11	K11	K14	K14	K14	K16	K16	K16	K16					
6011	70°	10°	K11	K11	K11	K11	K11	K14	K14	K14	K16	K16	K16								
		20°	K11	K11	K11	K11	K11	K11	K11	K14	K14	K14	K16	K16	K16						
7001	70°	10°	K11	K11	K11	K11	K11	K14	K14	K14	K16	K16	K16								
		20°	K11	K11	K11	K11	K11	K11	K11	K14	K14	K14	K16	K16	K16						
7011	71°	10°	K11	K11	K11	K11	K11	K14	K14	K14	K16	K16	K16								
		20°	K11	K11	K11	K11	K11	K11	K11	K14	K14	K14	K14	K16	K16	K16					
5010	73°	10°	K11	K11	K11	K11	K11	K14	K14	K16	K16	K16									
		20°	K11	K11	K11	K11	K11	K11	K14	K14	K14	K16	K16	K16							
8003	76°	10°	K11	K11	K11	K11	K11	K14	K14	K16	K16	K16									
		20°	K11	K11	K11	K11	K11	K11	K14	K14	K14	K16	K16	K16							
5007	78°	10°	K11	K11	K11	K11	K14	K14	K14	K16	K16										
		20°	K11	K11	K11	K11	K11	K14	K14	K14	K16	K16	K16								
7031	79°	10°	K11	K11	K11	K11	K14	K14	K14	K16	K16										
		20°	K11	K11	K11	K11	K11	K14	K14	K14	K16	K16	K16								
9005	80°	10°	K11	K11	K11	K11	K14	K14	K14	K16	K16										
		20°	K11	K11	K11	K11	K11	K14	K14	K14	K16	K16	K16								
			500	750	1000	1250	1500	1750	2000	2250	2500	2750	3000	3250	3500	3750	4000	4250	4500	4750	5000
			panel length B (in mm)																		

PROTECTIVE FILM & MARKING

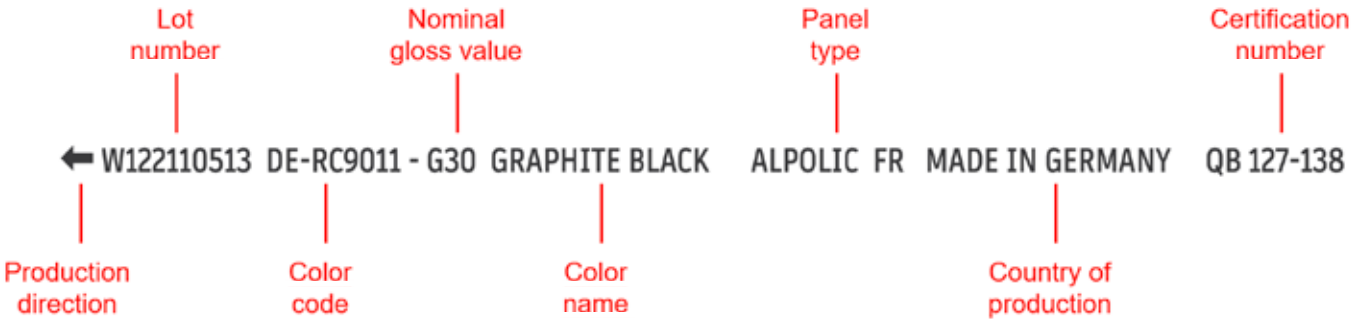
Protective film

During installation, each panel must follow the same direction as indicated on the protective film.



Marking

Example of ALPOLIC™ marking on the back of the panel



CLEANING & REPAIR

Storage

It is recommended that the panels are stored horizontally in a dry indoor environment to avoid the degradation of the protective film caused by moisture and direct sunlight. This protective film must be removed within 6 months of manufacture and a maximum of 20 days after installation.

Removal of light surface soiling

1. Apply a water rinse with moderate pressure to dislodge the soiling. If this does not remove the soiling, test a simultaneous water rinse with a sponge. If the soiling is still adhering after dry, test a diluted mild detergent.
2. When you use a diluted mild detergent, use it with soft sponges or soft rags. Wash the surface with uniform pressure and clean the surface in a horizontal motion first and then in a vertical motion.
3. Minimize the drip and splash of the mild detergent and rinse the rundown immediately to avoid streaking. Clean the surface from top to bottom and follow with a thorough rinse with clean water.

Removal of medium to heavy surface soiling

In order to remove medium to heavy soiling caused by grease and sealing material, alcohols such as IPA (Isopropyl alcohol), ethanol or N-hexane are used. Dilute these alcohols by 50 % with water. Strong solvents or solvents-containing cleaners may have a detrimental effect on the coating surface.

Carry out a spot test on a small non-visible area. Remove the spilled liquid with mild soap and rinse with water.

Caution

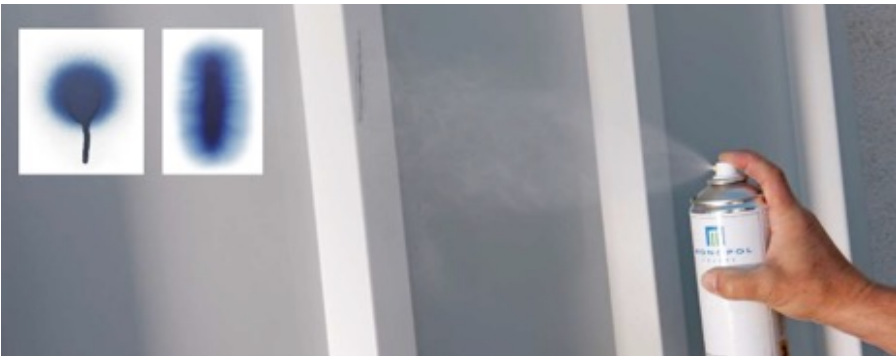
- Strong solvents and strong cleaner may cause damage to the coating. Do a spot test on a small non-visible area
- Do not use household cleaners containing abrasives
- Do not rub excessively as it may change the coating appearance
- Avoid drips and splashes. Remove the rundown as soon as possible
- Avoid extremely high and low temperatures
- Do not use paint removers, strong alkali or acid cleaners
- Do not use strong organic solvents such as MEK (Methyl Ethyl Ketone), MIBK (Methyl Isobutyl Ketone), Treclene (Tri-chloroethylene) or thinner
- Make sure that cleaning sponges and rags are grit free
- Do not mix cleaners

Graffiti removal

ALPOLIC™ panels with a LUMIFLON™ finish are already graffiti resistant at no extra cost, without any additional coatings. Please use the same graffiti removal method as the cleaning process above, but using Monopol's Monoclean X500 & X510 cleaning system.

Scratch repair system

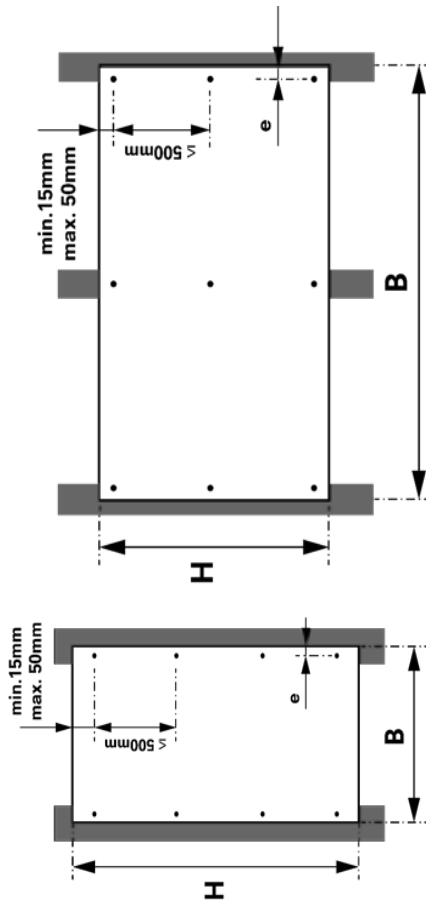
To repair and protect your surface, you can use Monopol Genuine FP quality touch-up paint in aerosol cans with the same colour and gloss to repair scratches and damage on-site.



25 w e w 50mm

Deflection limit: L/40 (wind pressure)

ALPOLIC™/fr, A2

[illegible]

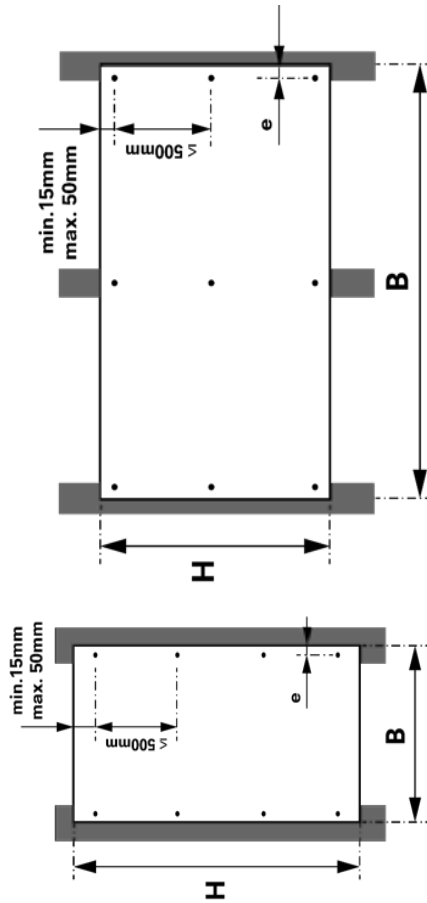
 Due to the higher mechanical performance of the ALPOLIC™ composite panel, this load table is not applicable to other composite panels. In addition, the thermal expansion of the façade panel must be checked. All data without guarantee.

ALPOLIC™/fr, A2

Deflection limit: L/70 (wind suction)

25 ≤ e ≤ 50mm

		Panel width B (mm)																															
		500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2200	2400	2600	2800	3000	3200	3400	3600	3800	4000	4200	4400		4600	4800	5000
3,0	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300
2,8	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300
2,6	425	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300
2,4	475	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300
2,2	500	320	320	320	320	320	320	320	320	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300
2,0	500	340	500	500	460	420	380	340	500	468	440	412	384	356	328	300	367	333	300	390	345	300	375	350	325	300	350	325	300	320	300	300	
1,9	500	365	500	500	447	420	392	365	500	468	440	412	384	356	328	300	380	340	300	420	380	340	300	350	325	300	350	325	300	370	350	300	
1,8	500	390	500	500	500	462	426	390	500	500	466	433	400	366	333	300	420	380	340	300	380	340	300	360	330	300	375	350	325	300	360	300	
1,7	500	400	500	500	500	467	433	400	500	500	500	462	424	386	348	310	452	405	357	310	386	348	310	400	370	340	310	366	338	310	370	300	
1,6	500	410	500	500	500	500	470	440	410	500	500	500	464	428	392	356	320	410	365	320	455	410	365	320	380	350	320	395	370	345	320	300	
1,5	500	500	500	500	500	500	500	477	453	430	400	500	500	463	427	391	355	451	403	355	472	433	394	355	440	410	380	355	420	380	355	300	
1,4	500	500	500	500	500	500	500	490	480	470	460	450	500	500	462	426	390	500	463	426	390	464	427	390	480	450	420	390	440	415	390	300	
1,3	500	500	500	500	500	500	500	500	500	480	460	440	420	500	500	447	395	500	500	448	395	500	464	430	395	470	445	420	395	420	395	300	
1,2	500	500	500	500	500	500	500	500	500	500	472	445	417	390	500	500	400	500	500	500	400	500	500	450	400	500	480	440	400	500	400	300	
1,1	500	500	500	500	500	500	500	500	500	500	500	470	440	410	500	500	500	460	500	500	500	460	500	500	480	460	500	500	460	500	500	500	
1,0	500	500	500	500	500	500	500	500	500	500	500	500	470	440	410	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	
0,9	500	500	500	500	500	500	500	500	500	500	500	500	500	470	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	
0,8	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	
0,7	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	
0,6	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	
0,5	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	
0,4	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	
Suction	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2200	2400	2600	2800	3000	3200	3400	3600	3800	4000	4200	4400	4600	4800	5000		



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ALPOLIC™
WORLDWIDE



Mahter Office Tower,
Amsterdam, Netherlands



Burj Al Arab,
Dubai, United Arab Emirates



GÜRALLAR LAPIS HAN,
Istanbul, Turkey



City Green Court,
Prague, Czech Republic



IBG Office building,
Groningen, Netherlands



Residential house,
Gava, Spain



Marina Bay Sands,
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