



SKY RAINBOW
Metal Composite Panel

Instruction Manual Of ACP

铝塑板使用手册

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Unloading, Transfer, Storage
卸货，搬运，存储



| Unloading, Transfer, Storage

To protect ACP composite panels from mechanical damage during transport, storage and handling, the following rules must be respected. Complaints based on improper handling will not be accepted.

Forklift request

Sufficient lifting force must be guaranteed.

Length of the forklift truck

- Use of sufficiently long forklift forks. If necessary, fork extensions should be used.
- The forks should ideally protrude on the opposite side of the pallet or be at least 2/3 inserted in the pallet to ensure safe transport.
- Lift the pallet first and only then tilt it to prevent the fork tips from being pushed through.
- The load centre of gravity should be as close as possible to the lift mast and in the middle between the forks.
- Do not lift the pallet with the fork tips. It can cause damage to the packaging or the product.

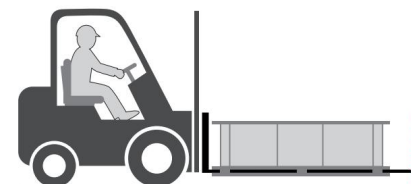
为了在运输、储存和处理过程中保护铝塑板复合板免受损坏，必须遵守以下规则。因不当处理而引起的投诉将不予接受。

对叉车的要求：

必须保证足够的提升力。

叉脚的长度

- 使用足够长的叉脚。如有必要，应使用延长的叉脚套。
- 叉车叉脚的理想位置是在托盘的相反一侧伸出，或者至少插入托盘的三分之二，以确保安全运输。
- 首先提升托盘，然后再将其倾斜。
- 货物的重心应尽可能靠近提升桅杆，并位于叉车叉的中间位置。
- 不要用叉尖抬起托盘，这可能会损坏包装或产品。



Forklift forks ideally protrude on the opposite side of the pallet.

叉车叉脚最理想的位置是在托盘的相反一侧伸出。

| Unloading, Transfer, Storage

Width adjustment of the forks

- Spread the forks to maximum width to prevent the pallet from bending, ACP panels from slipping and damage to the product or packaging. Lifting or transporting the pallet with forks together can cause the pallet to bend, which could damage the pallet and the product.

General handling

- Always lift or lower the pallets slowly to avoid bending. This prevents damage to the product or pallet.
- Stacked pallets must be secured against slipping when transported in closed trucks or containers.
- Appropriate edge protection should be used to prevent damage.

Storage

- If possible, the material should be stored inside the building to protect packaging and goods. If stored outdoors, protection against moisture should be provided.

Stacking

- It is recommended not to stack pallets in original packaging more than 5 units high. Long-term storage stacking requires each pallet to be stacked separately and can be stacked using tiered storage racks.

叉的宽度调整

- 将叉展开到最大宽度，以防止托盘弯曲、铝塑板滑动损坏产品或包装。
- 当叉车抬起托盘同时行驶移动，可能会导致托盘更弯曲从而损坏托盘和产品。

一般搬运

- 请缓慢抬起或放下托盘，以免弯曲。这可以防止损坏产品或托盘。
- 在封闭的卡车或集装箱中运输时，堆放的托盘必须固定防止滑动。
- 适当的侧面保护以防止碰撞损坏。

存储

- 如有可能，物料应存放在室内，以保护包装和货物。
- 如果存放在室外，应提供防潮保护。

堆放

- 短时间堆叠建议不要将托盘堆叠超过5个单位高。长时间存储堆放需要各个托盘单独堆放，可以使用分层存储架堆放。

| Unloading, Transfer, Storage

Hoisting

- Ideally, the ACP should be lifted with a suitable tool, such as a vacuum lifter. If this is not possible, the following instructions for manual lifting should be considered.

Safety

- For the handling of ACP panels it is generally recommended to wear cut-resistant protective gloves to avoid cut injuries.

Cleaning of working area

- Before unpacking the ACP panels, the designated work area should be thoroughly cleaned of dirt, stones, aluminium chips or other objects. The same applies to further processing.

Stacking of individual panels

- To avoid imprints, nothing should lie between the ACP sheets when stacking.

提升

- 理想情况下，铝塑板应使用合适的工具（如真空升降机）进行提升。如果必须手动抬起来和搬运，请遵守以下指导。

安全

- 用手搬运铝塑板时，一般建议佩戴防割伤防护手套，以避免割伤。

工作区域清洁

- 在打开铝塑板包装之前，应彻底清洁指定的工作区域，清除污垢、石头、铝屑或其他物体。后期加工过程中也需要保持清洁。

单个面板的堆叠

- 为了避免印痕，在堆叠时，铝塑板之间不应该有任何东西。

| Unloading, Transfer, Storage

Electrostatic charge

- Mechanically stacked panels in particular are usually electrostatically charged. Before repackaging/further processing, the existing packaging must be opened and the ACP panel adhering underneath must be loosened.

Transport

- For further transport, the ACP panels should always be lifted and carried vertically by two persons. To do this, grasp the panel at the four corners and lift it (do not pull it over each other) as shown " sketch1" .
- **When flipping the aluminum composite panel from horizontal to vertical, it is necessary to manually control the force and proceed slowly. Some large 3mm thick panels can generate significant twisting forces during the flipping process, leading to deformation, which may cause warping when used in a digital printer later on.**

Stock transfer

- Individual ACP panels must be completely lifted from the panels below, they must not be pushed over each other. We recommend the use of a vacuum lifter. The ACP panels should be lifted and transported along the long side as shown " sketch2" .

Number of persons required for repacking/transfer

- Panel length $\leq 4,500\text{mm}$: 4 persons required
- Panel length $\geq 4,500\text{mm}$: 6 persons required

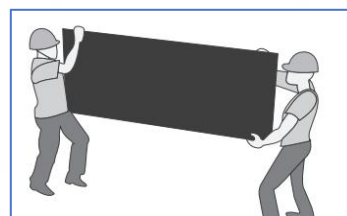


图1
Sketch1

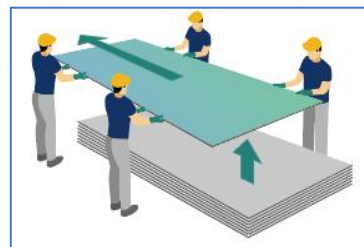


图2
Sketch2

静电电荷

- 机械堆叠的板材通常会带有静电，上下铝塑板可能会吸附一起。在重新包装或进一步加工之前，须先打开现有的包装，并将上下粘附的铝塑板分开才可以搬运。

搬运铝塑板

- 搬运铝塑板时，铝塑板应始终由两人垂直提起并搬运。为此，应在四个角处握住板材并将其抬起（不要将板材互相拖拉），具体见有“图1”。
- **在将铝塑板从水平翻转到垂直时，需手动控制力度，缓慢进行。某些3mm厚的大板在翻转过程中会产生较大的扭力，导致变形，后期在数字打印机中可能出现翘曲现象**

抬起铝塑板

- 单独的铝塑板必须完全从下方的板材上抬起，不可互相推拉。我们建议使用真空起重器。如果人工搬运，铝塑板应沿长边抬起并运输，具体方法见“图2”。

重新包装和搬运铝塑板所需人数

- 板材长度 $\leq 4,500$ 毫米：需 4 人
- 板材长度 $\geq 4,500$ 毫米：需 6 人

Instructions for Using
Protective Film
保护膜使用说明

B

Instructions for Using Protective Film

In order to keep the 3DPANEL surface protective film intact, the following requirements should be observed:

Do not tear the protective film during processing, and ensure that the protective film is not scratched as much as possible.

If the protective film is partially torn, the stain will accumulate on the surface of the board, when the protective film is completely torn, this part of the board needs special cleaning.

To avoid residuals of glue sticking to the surface of the panels due to UV radiation, it is recommended to remove the protective foil as soon as possible after the installation.

The protective foils and the panel surfaces must not be marked using ink (marker), adhesive tapes or stickers, as the lacquered surfaces could be damaged by solvents or plasticizers.

Make sure to remove the protective foil as soon as possible after installation as weathering for a longer period could make the foil difficult to remove.

为了保持三维板的表面保护膜完好无损，应遵守以下要求：

在加工期间不要撕开保护膜，并保证保护膜尽量不被划伤。

如果保护膜被部分的撕开，则污迹会堆积于板面，当保护膜完全撕开后，这部分板面需要特别的清洗。

环境温度的急剧变化和阳光的直接照射等恶劣条件可能会降低保护膜的耐久性。

为了避免由于紫外线照射而导致胶水残留粘附在面板表面，建议在安装后尽快去除保护膜。

不得使用墨水（记号笔）、胶带或贴纸在保护膜和面板表面上做标记，因为溶剂或增塑剂可能会损坏漆面。

确保在安装后尽快去除保护膜，因为较长时间的风化会使膜难以去除。



CUTTING METHOD
切割方法



CUTTING

General Cutting Methods

Aluminum composite panels can be cut using circular saws, band saws, or jigsaws. If the edges are rough after cutting, it is usually due to the following reasons: the cutting tool has overly rounded edges, the machine base is not properly padded, excessive machine vibration, or too much debris on the saw blade causing heat buildup. If the feed speed during cutting is too fast, debris from the core material can accumulate and easily block the dust extraction system, affecting the cutting performance of the ACP. Therefore, it is crucial to choose the appropriate equipment and cutting parameters to control the debris generated and the heat produced.

Cutting for Complex Shapes

Complex shapes can be cut from ACP using CNC machines, water jet cutters, profile milling machines, contour saws, and jigsaws. When using a water jet cutter, it is advisable to employ abrasive cutting. Additionally, drill a hole in the middle of the panel before cutting; this provides a stable starting point, ensuring a smooth cutting process and preventing uneven edges and cutting issues.

Shearing and Punching

ACP can also be cut using a shear machine, but it is essential to place padding on the mold! Due to the viscoelastic properties of the core material, cutting on the panel's shearing surface may result in slight deformation of the aluminum surface on the front side. Generally, small marks on the edges of the panel do not affect its use. However, to prevent damage from impact, it is recommended to place a rubber pad on the front side of the panel.

Punching

ACP of any thickness can be processed using standard punching equipment. To ensure high-quality punching, it is essential to use a very flat bottom die and minimize the gap as much as possible. Additionally, the punching process may cause slight deformation of the surface panel.

一般裁切加工方法

切割铝塑板可以使用圆盘锯、带锯或曲线锯。如果切割后的边缘产生毛糙，通常是由于以下原因：刀具边缘过于圆滑、机器底部没有垫好、机器震动过大，或者锯片上有过多的碎屑导致热量积聚。如果切割进给速度过快，板材核心的碎屑会堆积，容易堵塞吸尘管路，从而影响铝塑板的切割效果。因此，选择合适的设备和切割参数非常重要，以控制产生的碎屑和热量。

复杂情况的切割

可以使用CNC机器、水割枪、型材铣形设备、仿形锯和曲线锯来切割铝塑板以实现复杂形状。使用水割枪时，建议采用研磨性的切割方式，并在切割前先在板中间钻孔，这样可以提供一个稳定的起始点，确保切割过程顺利，避免不均匀的边缘和切割问题。

剪切、冲切加工方法

铝塑板也可以使用剪切机进行剪切加工，但一定要在模具上加铺垫物！由于芯层材料的粘弹性能，在板材的冲切面上进行剪切时，可能会导致板正面铝表面出现少量变形。通常情况下，板边部的微小痕迹不会影响其使用。然而，为了避免冲击对板材造成损伤，建议在板的正面垫上一块橡胶板。

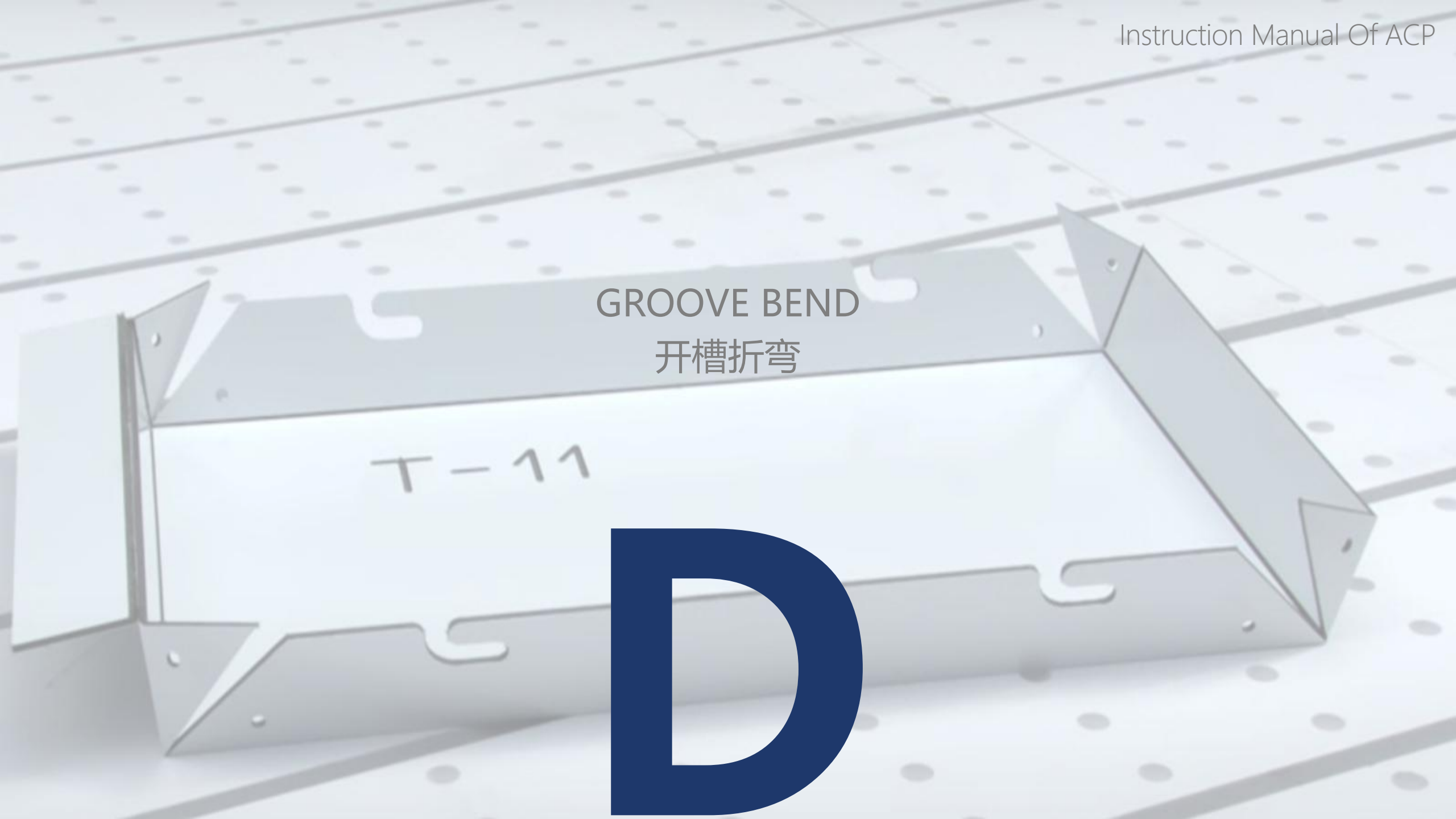
冲切

任何厚度的铝塑板都可以使用普通的冲切设备进行冲切加工。为了确保高质量的冲切，必须使用非常平整的底模，并将间隙调至尽可能小。此外，冲切过程可能会导致表面板出现轻微变形。

GROOVE BEND
开槽折弯

T-11

D



GROOVE BEND

The main feature of ACP panels is that they can be easily cold-formed using simple techniques. Processors can create panels of various sizes and shapes using straightforward grooving and bending techniques. When grooving, a circular saw or milling cutter is used to create V-shaped or rectangular grooves along the bending line on the back of the panel, leaving a portion of the polyethylene core layer intact. After grooving, bending can be done by hand without the need for any equipment. The corner radius of the bent panel depends on the shape and depth of the groove.

The compelling advantages of this technique include:

- Simple and easy processing technology;
- Bending can be done both in the workshop and on-site;
- Allows for different design shapes;
- The shape of the panel is not affected by the size of the processing equipment;

铝塑板的主要特点就是它能用十分简单的技术冷加工成型。加工商用简单易行的开槽和折边技术可以制作出各种尺寸和形状的板。开槽时，使用圆盘锯或铣刀在板的背面沿着所要折的边线开出V形或方形槽，开槽后板应留一部分的聚乙烯芯层。开槽之后用手即可进行折边工作，不需要使用任何设备。板折弯后的转角半径取决于槽的形状和深度。

这一技术令人信服的优点有：

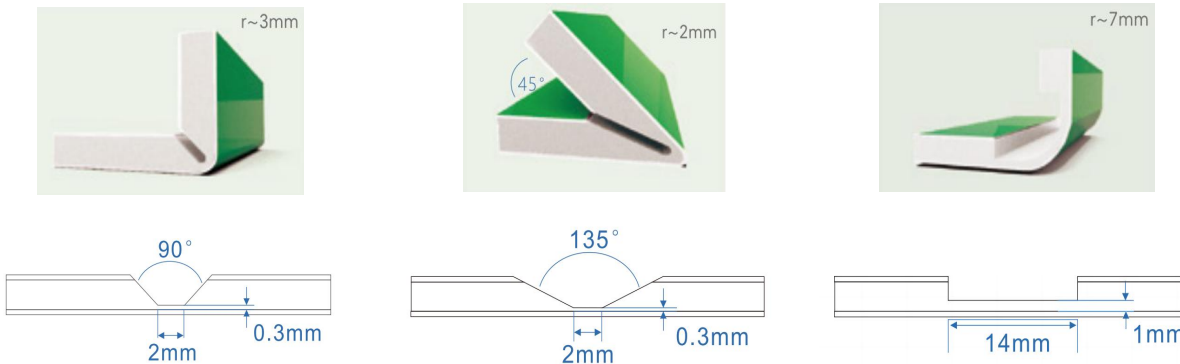
- 简单易行的加工技术；
- 折边既可以在车间进行，也可以在现场进行；
- 可实现不同的设计造型；
- 板的加工形状不受加工设备大小的影响；



GROOVE BEND

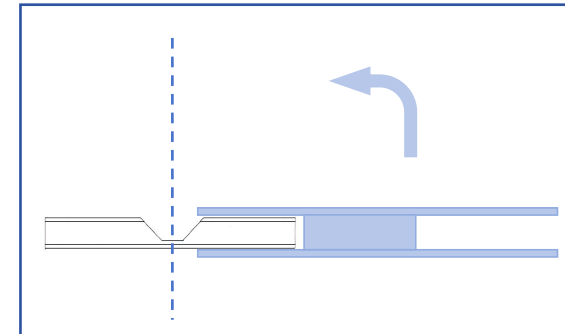
After grooving and bending using the different methods listed below, the corner radius of the panel will be between 2~7mm:

- Use a milling cutter to create V-shaped or rectangular grooves along the bend line on the back of the panel. For V-shaped grooves, leave a 0.3mm thick layer of polyethylene on the front of the panel; for rectangular grooves, leave a 1.0mm thick polyethylene layer.
- For grooving, it is recommended to use a fixed grooving machine with a slotting cutter or a manual grooving machine with a guide rail or template. The corner radius of the bent panel will depend on the groove's shape and depth. Auxiliary methods, such as using H-shaped aluminum profiles with battens, can facilitate bending.
- Please strictly follow the grooving process above, especially for high-volume grooving, to ensure accurate groove depth.



用下述所列的不同方法开槽、折边后，折弯角半径为2~7mm:

- 使用铣刀在板背面沿着折边线开V形或方形槽。开V形槽时，在板正面应留下0.3mm厚的塑料芯层，开方形槽时留下1.0mm厚的塑料芯层。
- 对于开槽加工，适合使用带开槽铣刀的固定式开槽机，或者手动开槽机沿着轨道进行开槽。板材弯曲后的转角半径会根据槽的形状和深度有所不同。如果使用辅助工具，比如带有板条的H型铝型材，可以更方便地进行折边。
- 请严格按照上述开槽工艺进行加工，尤其是在大批量开槽加工时，必须保证开槽深度正确。



OPEN HOLE

开孔



| OPEN HOLE

Drilling:

Aluminum composite panels can be drilled using drill bits specifically designed for aluminum or metal. During the drilling process, it is essential to quickly remove debris, especially the debris from the plastic core. This requires using high rotational speed and low feed rate, and occasionally lifting the drill bit to blow away the debris with compressed air.

Countersinking:

When processing countersunk holes, specialized drill bits for aluminum (such as flat-bottom drills) can be used. The countersunk holes should be positioned a certain distance from the edges of the panel, and flat-head taps can be used to drill holes in the aluminum composite panel. These specialized drill bits are designed for pre-drilling or drilling countersunk holes to ensure effective processing.

钻孔:

铝塑板可以使用专门用于铝或金属的钻头进行打孔。在钻孔时，需要迅速清除碎屑，特别是塑料芯材的碎屑。这要求使用高转速、低进给速度，并且偶尔提起钻头，用压缩空气将碎屑吹走。

埋头孔:

加工埋头孔时，可使用专门用于铝材的钻头（如平底钻等）。埋头孔应离板边部有一定距离，可以使用平头螺丝攻在铝塑板上钻孔。这些专用钻头旨在预先钻孔或钻埋头孔，以确保加工效果。

备注:

使用高转速的原因:

提高效率：快速切入材料，缩短加工时间。

减少切割力：短接触时间降低对材料的损伤和变形。

改善质量：获得更光滑的切割面，减少毛刺。

促进冷却：产生气流，有助于散热，防止过热。

清除碎屑：快速旋转有效抛出碎屑，保持切割区域清洁。

综上所述，高转速提高了铝塑板钻孔和切割的效率、质量和安全性。

低进给速度指切割或钻孔时，刀具向材料移动的速度较慢:

减少热量：防止过多热量产生，降低变形风险。

提高精度：提高孔的形状和尺寸准确性。

清除碎屑：提供更多时间清除碎屑，减少堵塞风险。

总之，低进给速度能改善钻孔或切割的质量和效率。

Curved ARC
Processing Method
弧形弯曲加工方法



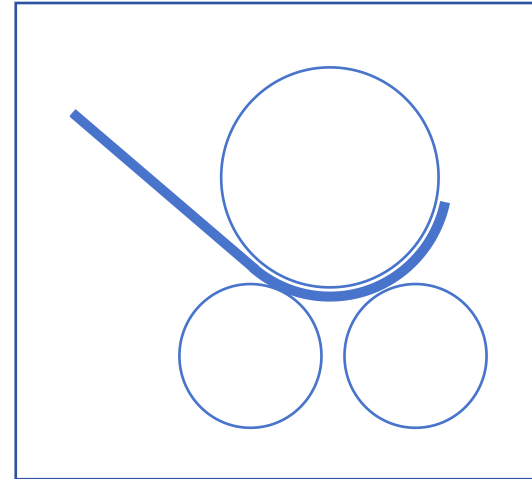
| Curved ARC Processing Method

ACP panels can be bent into curves using traditional methods for processing metal or plastic sheets. However, due to certain unique properties of composite panels, a few points need to be emphasized:

- Minimum bend radius $r=10\times t$ (where "t" is the panel thickness)
- ACP panels have a higher spring-back rate compared to other isotropic sheets, so it's recommended to create a sample first when bending a large quantity of panels.
- During the bending process, protect the panel surface by placing a 1–2mm thick plastic sheet over the aluminum surface.

铝塑板可以使用传统的加工金属或塑料板材的方法弯弧加工，但由于复合材料板材的一些不同特性，有几点需要强调：

- 最小弯弧半径 $r=10\times t$ (t: 板厚)
- 铝塑板的回弹指数要比其他各向同性板大，当弯弧板数量较多时，应先试做样品。
- 弯弧过程中要对板表面进行保护，可以用1~2mm厚的塑料板垫在铝板表面。



Curved ARC Processing Method

Bending with a Press Brake

- Aluminum composite panels can be easily processed using a bending machine, just like metal sheets. During the processing, the panel is placed on a bottom die (grooved or rail), and the top die applies pressure downward using pneumatic force to bend the panel. The curvature of the bend is determined by the width of the bottom die and the stroke of the top die.
- Ideal bottom die width: $2 \times t + 2 \times$ protective film thickness + top die diameter + 15 mm. For the bent section, at least five times the panel thickness should remain along the edge to avoid bending issues.

Bending with a Folding Machine

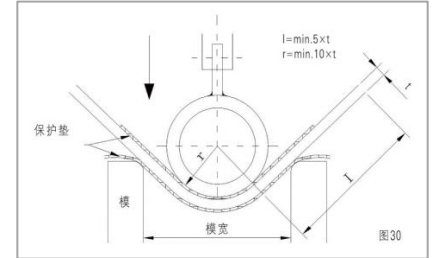
- When using a folding machine, clamp the ACP panel and then rotate the panel around the upper mold with a movable lower mold to form the curved section.

Bending with a Roll Bending Machine

- ACP panels can also be curved with a standard metal roll bending machine, typically using a three-roller or four-roller setup. Avoid applying excessive pressure on the rollers. If the roll bending machine is also used for other metal sheets, make sure to thoroughly clean any metal debris from the roller surfaces before bending ACP panels to prevent damage to the panel surface.

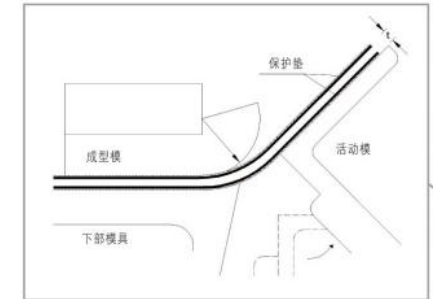
用压弯机压弯成型

- 铝塑板可以像金属板材一样，轻松地使用压弯机进行加工。加工过程中，板材放在底模（槽形或轨道）上，顶模会向下施加压力，通过空气压动力使板材弯曲。弯曲的弧度由底模的宽度和顶模下压的距离决定。
- 理想的底模宽度： $2xt + 2x$ 保护膜厚度 + 顶模直径 + 15mm 弯弧部分最少要有5倍板厚的板边以至无法弯弧。



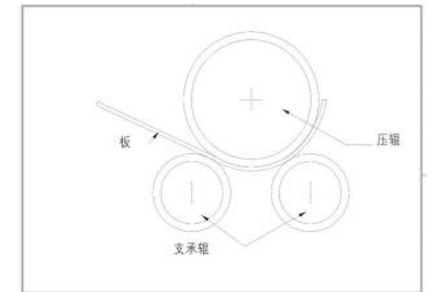
用折弯机弯弧加工

- 当使用折弯机加工时，要用夹具将铝板夹住，然后将弯弧部分的板由可以移动的下模围绕圆弧形上模翻转将板弯弧。



用滚弧机弯弧加工

- 铝塑板可以使用普通金属滚弯弧机进行弯弧加工，主要使用三辊或四辊弯弧机，特别注意压辊不要施加太大压力。如果滚弯弧机也同时用来加工其他金属板材，则必须在加工铝塑板之前将辊轮表面的金属碎屑彻底清理干净，以免对板面造成损伤。



Connection And Fixing Technique

连接和固定技术



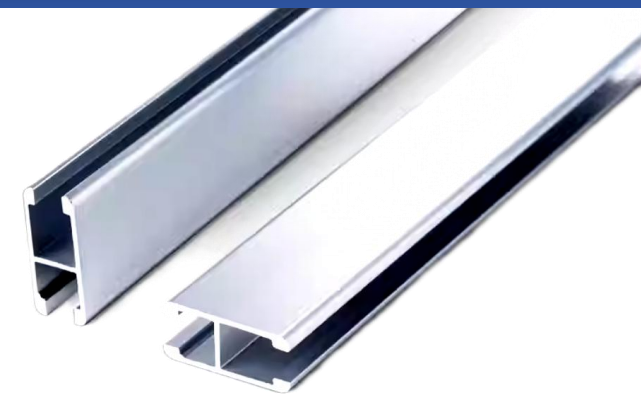
| Connection And Fixing Technique

ACP panels can be connected following standard methods for metal or plastic sheets. When fixing ACP panels to other metal frames (non-aluminum) or using bolts or screws, please keep the following points in mind:

- Only fasteners and structural frames made of aluminum, plastic, or stainless steel should come into direct contact with the aluminum surface of ACP panels. If other materials are used, apply insulating spacers or protective coatings to prevent corrosion.
- For outdoor use, consider the thermal expansion of ACP panels to avoid deformation due to compression. The minimum gap required depends on the panel's expansion rate. The linear thermal expansion rate of ACP panels is determined by the aluminum surface layer. With a temperature difference of 100°C, the longitudinal expansion is 2.4mm per meter.
- When assembling or installing ACP panels on-site, ensure that all panels are oriented in the same direction, as indicated by the arrow on the protective film or on the back of the panel.

铝塑板可以按照金属板或塑料板的标准方法连接。如果将铝塑板固定到其他金属框架而非铝材，或用螺栓、螺丝将板固定，则应注意以下几点：

- 只有铝、塑料或不锈钢材质的紧固件和结构框架可直接接触铝塑板的铝表面。当使用其他材料时，请垫上绝缘垫片等或使用保护涂层以防锈蚀。
- 在室外使用铝塑板板，请考虑板的热膨胀，以避免板受挤压而变形。所需留出的最小空隙取决于板的膨胀率。
- 铝塑板的线性热膨胀率取决于表面铝皮。温差为100°C时，纵向膨胀率为2.4mm/m。
- 在组装或工地现场安装铝塑板铝塑板时，必需保证按照同一方向(保护膜或板背面的箭头标示的方向)进行。



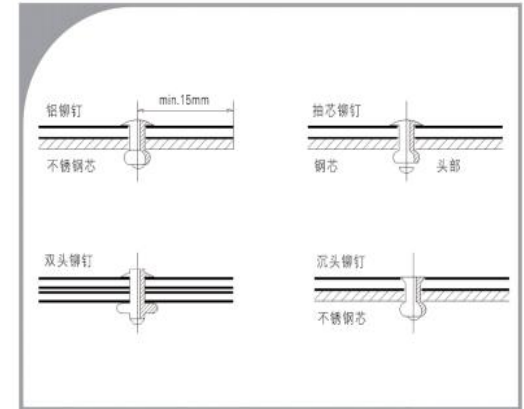
Connection And Fixing Technique —— Riveting 铆接

When using rivets to connect ACP panels outdoors, consider the thermal expansion rate of the panels. The holes on the panels should be large enough to allow for expansion, avoiding deformation due to compression. Rivets suitable for aluminum structures can be used to join ACP panels or to connect ACP panels to other materials.

- In outdoor or high-humidity areas, use stainless steel blind rivets to prevent corrosion along the panel edges. When using stainless steel blind rivets, the core should be removed after riveting (detachable rivets).
- To prevent panel deformation, use rivet support clamps to embed the rivet into the hole. Manufacturers of blind rivets offer these auxiliary clamps, with top diameters ranging from 11mm to 14mm.
- Standard color caps can be placed over the rivet heads for decoration.
- **Countersunk rivets do not allow for panel expansion, making them unsuitable for outdoor use.**
- Note: Please remove the protective film from the aluminum panel before riveting.

在室外使用铆钉连接铝塑板，应考虑板的热膨胀率，板上的洞眼应留有足够的间隙以允许其膨胀，避免板受挤压变形。可用适合于铝结构的铆钉将铝塑板连接起来，或将铝塑板与其他材料连接。

- 在室外或湿度较大的地区，应使用不锈钢抽芯铆钉，以防止板材边缘生锈。在使用时，不锈钢抽芯铆钉应在铆接后抽出（可拆卸式铆钉）。
- 为了防止板材在铆接过程中发生变形，可以使用铆钉辅助夹具来将铆钉准确地嵌入预先打好的孔中。抽芯铆钉的生产商提供这种辅助夹具，夹具的顶部直径通常在11mm到14mm之间。
- 可以使用标准彩色装饰帽套在铆钉头上。
- **沉头铆钉不允许板材膨胀，因此不适合在室外使用。**
- 注意：请在铆接前剥去铝板保护膜



| Connection And Fixing Technique —— Screw fastening 螺钉链接法

Screws for Indoor Use

- Various metal and wood screws with different cap shapes are suitable for indoor applications. Typically, panel expansion is not considered.
- Countersunk screws can be pressed into the panel along with the surrounding aluminum surface using standard methods. When using this approach, the hole diameter in the panel must be larger than the screw diameter.

Screws for Outdoor Use

- When using screws outdoors, consider the thermal expansion and contraction of ACP panels. To prevent panel deformation, the hole size in the panel must account for future thermal expansion.
- Using specialized screws can help prevent panel deformation. Ensure that the screws are the correct size and properly fit.
- Standard color caps can be placed over the screw heads for decoration.

• 室内用螺钉

- 有不同帽形的金属板和木板专用铆钉可以适用于室内。通常不考虑板的膨胀。
- 沉头铆钉可用一般的方法将其连同周围的铝面一起压入板。使用后一种方法时，板上洞眼的直径必须比螺钉直径大。

• 室外用螺钉

- 户外使用螺钉时，应考虑铝塑板的热胀冷缩。为防止板的变形，板上洞眼的大小必须考虑板以后的热膨胀。
- 用特种螺钉固定板就不会造成板的变形。请确定螺钉的尺寸，应大小合适。
- 可用标准彩色装饰帽盖在螺钉头上。

| Connection And Fixing Technique —— Bonding method 粘接法:

Metal Adhesives / Universal Adhesives

Most metal adhesives or universal adhesives are suitable for constructing exhibition stands with aluminum composite panels and for bonding them to machinery.

Adhesive Tape / Velcro Tape

Double-sided adhesive tape (such as products from 3M or acrylic foam tape) is available for applications with low tensile strength and only lateral tensile requirements.

Velcro tape can be used for movable joints. 3M's SCOTCHMATE or Dual Lock can also be used.

Adhesive Sealant Components

When a high-strength elastic bond is required, we recommend the following single-component adhesives: Sika Bond T1 by Sika Chemie GmbH (polyurethane adhesive), Dow Corning 895 by Dow Corning GmbH (polymer adhesive). The above adhesives can be used for concealed connections outdoors.

Note: Please use correctly according to product instructions and manufacturer requirements. Adhesives and sealants cannot bond the core material of ACP panels (e.g., at the cross-section). Large-area bonding of ACP panels with other materials may lead to deformation between the composite layers (due to differing ductility/dissimilar metal effects).

金属胶/万能胶粘结

大多数金属胶或万能胶适用于用铝塑板制作交易会或展览台的结构, 以及将其粘接到机器设备上。

胶粘带/Velcro胶粘带

双面胶带(例如3M公司的相关产品或压克力发泡胶带)可供上述低抗拉强度和只有横向拉力要求的应用。

Velcro胶粘带可用于活动节点。3M公司的SCOTCHMATE或Dual Lock也可使用。

粘性密封胶组分

当需要高强度弹性连接时, 我们建议以下单组分胶粘剂: Sika Bond T1 Sika Chemie GmbH(聚氨酯粘结剂), Dow Corning 895 Dow Corning GmbH(聚树脂粘结剂), 上述粘结剂可用于室外的隐蔽式连接。

注意: 请按照产品使用说明和生产厂家的要求正确使用。粘结剂和密封胶不能粘结铝塑板芯层材料(如断面处)。

铝塑板与其他材料一起大面积粘结, 可能导致板复合层之间的变形(由于不同的延展性/双重金属效应)。

Spray Painting
Screen Printing
Digital Printing
喷漆, 丝网印刷, 数码打印



| Spray Painting, Screen Printing, Digital Printing

Painting on the Polyester Coating of Aluminum Composite Panels

In the factory, surface treatment and primer rolling are applied to the aluminum panels, ensuring stable quality and facilitating subsequent painting on the baked finish of the aluminum composite panels.

Steps for Painting Aluminum Composite Panels:

- Pre-clean the panel surface using methanol alcohol.
- Sand the exterior surface with wet sandpaper (grit size 360).
- Wipe off the sanding dust with a lint-free cloth moistened with alcohol.
- Follow the instructions provided by the exterior coating supplier for the outer coating.

Please Note:

- During rapid drying, the maximum allowable temperature for the panels (aluminum composite panels) is 70°C. Care must be taken to avoid deformation during high-temperature drying.
- The cut edges of the aluminum composite panels should not be in prolonged contact with organic solvents to prevent weakening of the material's adhesion.
- Finished aluminum composite panels after spraying cannot be bent or folded. Due to the low elasticity of the outer coating, the paint surface is prone to damage during bending or folding.
- Testing should be conducted before spraying, and the instructions from the paint supplier should be followed during application.

在铝塑板板材的聚酯烤漆面上涂漆(喷漆)

在工厂里对铝板表面进行处理和辊涂底漆，这样可确保质量稳定，有利于在铝塑板板材的烤漆面上再次涂漆。

铝塑板涂漆步骤:

- 使用含甲醇酒精对板材表面进行预清洗;
- 用湿润的砂纸(磨粒大小360)打磨外表面;
- 用沾上酒精的无尘布将打磨的粉尘擦除;
- 对于外涂层，请遵守外涂层供应商的说明书进行操作。

请注意:

- 快速烘干时，板材(铝塑板板材)的最大允许温度为70°C。在高温烘干过程中，铝塑板板材必须小心轻放以防止变形。
- 铝塑板板材的裁切边不能长期接触有机溶剂，以避免减弱材料的结合力。
- 后续工艺中完成喷漆的铝塑板板材不能进行折弯和折边处理。由于外涂层弹性低，折弯或折边时容易损坏漆面。
- 在喷漆前进行测试，喷漆时应遵守油漆供应商使用说明。

| Spray Painting, Screen Printing, Digital Printing

Screen Printing on the Polyester Coating of Aluminum Composite Panels

Aluminum composite panels that have undergone baking treatment are particularly suitable for screen printing. Before screen printing, the protective film must be removed, and the panel surface should be cleaned with a lint-free cloth moistened with ethanol or isopropanol. Do not apply alcohol directly to the panel surface. Using methanol may corrode the paint layer. After cleaning, allow the alcohol to evaporate for 10 to 15 minutes before proceeding with screen printing. Practice has shown that even if the panel's baked finish and the ink used meet technical specifications, various deviations can occur during screen printing. Therefore, it is necessary to test the adhesion of the ink for different applications.

Digital Printing on the Digital Coating of Aluminum Composite Panels

Extensive testing has confirmed that aluminum composite panels with a digital polyester coating are suitable for direct digital printing. All standard colors can be printed on aluminum composite panels.

Before printing, the protective film must be removed, and the panel surface should be cleaned with a lint-free cloth moistened with ethanol or isopropanol. Do not apply alcohol directly to the panel surface. Using methanol may corrode the paint layer. After cleaning, allow the alcohol to evaporate for 10 to 15 minutes before printing. Please follow the instructions provided by the ink supplier.

Laminating/Adhering Images

Using cast or calendered self-adhesive sheets, aluminum composite panels can be laminated (manually or by equipment). The clear coat will not peel off when changing sheets.

When adhering images, use adhesive films or discrete adhesives. Before applying the film layer or image, clean the panel surface to ensure it is free of dust.

在铝塑板板材的聚酯漆面上进行丝网印刷

经烤漆处理后的铝塑板特别适合丝印。丝印前，必须去除保护膜并用沾有乙醇或丙醇的无绒布清洗板材表面。切勿直接在板材表面涂抹酒精。如果使用甲醇，漆层可能被腐蚀。清洗完毕后，待酒精挥发10-15分钟后再进行丝印。实践证明，即使板材烤漆和所用油墨都在技术规格要求之内，丝印时也会有各种偏差，因此针对不同的应用情况，应当对选用油墨的粘附性进行测试。

在铝塑板板材的digital漆面上进行数字印刷

经过广泛的测试，证明含digital聚酯涂漆的铝塑板适合直接进行数字印刷。可在铝塑板上印刷所有标准色。

在印刷前，必须去除保护膜并用蘸有乙醇或丙醇的无绒布清洗板材表面。切勿直接在板材表面涂抹酒精。如果使用甲醇，漆层可能被腐蚀。清洗完毕后，待酒精挥发10-15分钟后再进行印刷。请遵守油墨供应商的指示。

覆层/图片粘贴

铝塑板可以使用（铸型或压延的）自粘合薄片贴在表面，可以手动操作或通过设备完成，更换薄片时不会导致清漆脱落。

在粘贴图片时，可以使用粘性膜或离散粘合剂。在贴上膜层或图片之前，确保对板材表面进行清洗，以保证没有灰尘。

Recycling of
composite panels
复合板的回收



| Recycling of composite panels

Aluminum composite panels, consisting of a low-density polyethylene (PE) core and double-sided aluminum face panels, are primarily used for building facades. The panels typically have a thickness of 4mm, containing about 50% aluminum, yet they exhibit excellent rigidity, lightweight characteristics, and ease of processing and installation.

Material Recycling Process

One of the challenges faced by manufacturers of aluminum composite panels is the recycling of waste panels, particularly the economic separation of aluminum panels from the PE core. An effective method for recycling large-sized panels involves using rolling techniques to separate the aluminum from the plastic. For smaller aluminum composite panels, cutting them into smaller pieces and grinding them can facilitate the separation of aluminum from plastic.

The aluminum panel portion can be recycled and remelted as a single material, while the PE portion, after simple processing, can be reused in the production of composite panels. Manufacturers can be responsible for the recycling of waste panels generated during the processing and installation of aluminum composite panels.

铝复合板铝塑板由低密度聚乙烯(PE)芯材和双面铝面板复合而成主要被用在建筑外墙上，板材厚度通常为4mm,板材重量只含约50%的铝材但具有极好的刚度，较轻的重量并容易被加工并安装到建筑上。

材料的回收过程

铝复合板的生产厂商所面临的一个问题就是废板的回收问题，而其中主要的难题是如何经济地将铝面板和PE芯分开：对大尺寸板的有效回收方法是通过滚压将铝与塑料分开，对小尺寸铝复合板切成小块之后磨粉后将铝与塑料分开。

铝面板部分可以作为单一材料回收重新轧制，PE部分经过简单的整理后可再用于复合板的生产。对于铝复合板加工安装过程中产生的废板可以由生产商负责回收。



Weather resistance of
aluminum panel without paint
没有涂油漆的铝板的耐候性

J

| Weather resistance of aluminum panel without paint

The aluminum alloy panel of the aluminum composite panel (ACP) uses aluminum alloys from series 3000 and above, commonly referred to as anti-rust aluminum in China. One of the main characteristics of this aluminum material is its excellent weather corrosion resistance. Therefore, the back aluminum panel of the ACP does not require a baked paint finish (though the actual product may use a protective baked paint).

Generally, aluminum alloys do not rust. This is because when untreated aluminum is exposed to air, a chemical change occurs on its surface, forming an oxide film that quickly develops to a thickness of about 0.1mm and then stops increasing. This oxide layer has excellent weather resistance and prevents further oxidation of the aluminum surface.

When aluminum is placed in a humid environment or comes into contact with water, white water stains may appear on its surface. However, once the water dries in a dry environment, the oxidation on the surface immediately stops and does not penetrate further into the aluminum panel, and the aluminum's performance remains unaffected. Occasionally, aluminum panels may accidentally get wet during transportation or storage, resulting in white water stains on the back of the panel. As long as the panel remains dry after installation, these stains will not affect its normal use.

However, when exposed to certain corrosive environments, there is a possibility of ongoing oxidation. For example, cement walls in humid environments are alkaline, and bare aluminum in such settings may continue to oxidize.

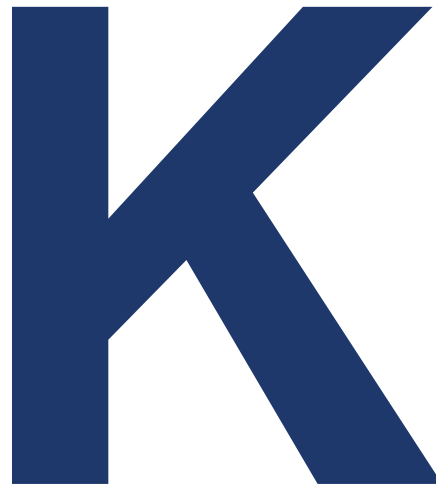
铝塑板的铝合金面板采用3000系列以上的铝合金，在中国称为防锈铝，顾名思义，这种铝材主要特点之一就是耐气候腐蚀性能很好。因此铝塑板的背面铝面板不需要烤漆(实际产品也可能使用保护性烤漆)。

通常铝合金本身是不生锈的，这是由于当表面未作处理的铝材开始暴露在空气中时，其表面会发生化学变化，在板的表面立刻产生一层氧化膜的厚度会逐渐增厚直到约0.1mm,然后就不再增加。这层氧化膜有很好的耐气候性能且可以防止铝材表面进一步的氧化。

当铝材放置在很潮湿的环境中或其表面沾水时，表面会出现白色水渍，但是铝表面水迹干了以后，在干燥的环境中，其表面的氧化就立即停止而不会继续深入到铝板内部，而铝的各项性能不会受到任何影响。有时，铝板在运输或贮存过程中不慎沾水，板背面出现白色水渍，只要板在安装以后可以保持干燥，则该水渍不会影响板的正常使用。

但是当处于一定腐蚀环境中，会出现持续氧化可能性，比如潮湿环境下的水泥墙体具有碱性，光铝处于这样的环节会持续氧化。

Surface maintenance
and cleaning
表面维护和清洁



| Surface maintenance and cleaning

The surface of aluminum composite panels requires regular professional cleaning and maintenance. This cleaning is not only to keep the building's walls looking clean and attractive but also to remove accumulated dirt on the paint surface that could damage the coating, ensuring the long-term quality of the paint.

The frequency of cleaning primarily depends on the environmental conditions of the project site and the actual level of contamination on the panel surface. We recommend that the exterior walls of the building be cleaned at least once a year, while interior walls should be cleaned based on the actual level of dirt.

Cleaning the building's walls should be done manually or with appropriate cleaning equipment, starting from the top and working down. Please do not use any abrasive items to scrub the painted surface.

The specific cleaning steps are as follows:

- First, rinse the panel surface with plenty of clean water.
- Use a soft cloth soaked in a diluted detergent solution to gently wipe the panel surface.
- Rinse the panel surface again with plenty of clean water to wash away dirt.
- Inspect the panel surface; for any areas that are not clean, apply detergent and scrub them thoroughly.
- Rinse the panel surface with clean water until all detergent is removed.

Note: Do not clean hot panels (temperature above 40°C), as rapid evaporation of moisture can harm the paint! It is especially important to choose an appropriate detergent; a basic principle is to use a neutral detergent! Do not use strong alkaline detergents such as potassium hydroxide, sodium hydroxide, or sodium carbonate, strong acidic detergents, abrasive detergents, or paint-dissolving detergents.

Additionally, before starting large-scale cleaning, it is best to test a small area of the panel first and only proceed with the official cleaning once safety is confirmed

铝复合板的表面烤漆需要定期的专业化的清洗和维护。这样的清洗并不仅仅是为了使建筑的墙体保持干净漂亮的表面，而是要定期将积在烤漆表面的对烤漆会有侵害的污浊去除，以保证烤漆的长期质量。

清洗工作的周期主要取决于项目所在地的环境条件以及板面实际污染的程度而定，我们的建议是建筑外墙每一年至少清洗一次，室内墙体则应视实际脏污程度而进行表面清洗。

建筑墙体的清洗应该用人工或适当的清洗设备由上到下的进行。请不要使用任何带有磨蚀性的物品擦洗烤漆表面。

具体的清洗步骤如下：

- 先用大量清水冲洗板表面；
- 使用浸有经水稀释过的洗涤剂的软布轻轻的擦拭板面；
- 再用大量的清水冲洗板面，将脏物冲走；
- 检查板面，对于没有洗干净的地方用洗涤剂重点清洗；
- 用清水冲洗板面，直至将洗涤剂全部冲掉。

注意：不要清洗热的板面(温度超过40°C时),因为水分过快的挥发对板面烤漆有害!特别需要注意的是,请选用合适的洗涤剂,一个基本的原则是:一定要选用中性洗涤剂!请不要使用强碱性洗涤剂例如氢氧化钾、氢氧化钠或碳酸钠,强酸性洗涤剂,磨蚀性洗涤剂以及烤漆溶解性洗涤剂。

另外开始大面积清洗前,最好先选一小块板面作试验,待确认安全后再正式开始。