



SKY RAINBOW
Metal Composite Panel

"3D Panel Processing Manual"

三维板加工手册

| CUTTING METHOD 切割方法

General Cutting Methods

- For cutting 3DPANEL panels, you can use a circular saw, band saw, or jigsaw. If the cut results in rough edges, this is often due to rounded edges on the tool, inadequate machine support, excessive machine vibration, or a buildup of debris on the saw blade, causing heat. If the feed speed is too fast, debris from the core material may clog the dust extraction system. Therefore, it is essential to select appropriate equipment and cutting parameters to control both debris and heat generation during 3DPANEL panel cutting.

Cutting for Complex Shapes

- Complex shapes can be cut using CNC machines, contour saws, and curved saws.

一般裁切加工方法

- 切割三维板可以使用圆盘锯、带锯或曲线锯切割。如果切边毛糙，多半是因为刀具边部以切成圆角、机器下面没垫好、机器震动太大或锯片边上有太多的碎屑生热。如果切割给进速度太快，板芯材的碎屑会堆积成块而易堵塞吸尘管路，因而裁切三维板。需要选择合适的设备和切割参数，使产生的碎屑和产生的热量得到控制。

复杂情况的切割

- 可以使用CNC机床、仿形锯和曲线锯切割出复杂的形状。



| Groove And Bend 开槽折弯

The main feature of 3DPANEL 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.

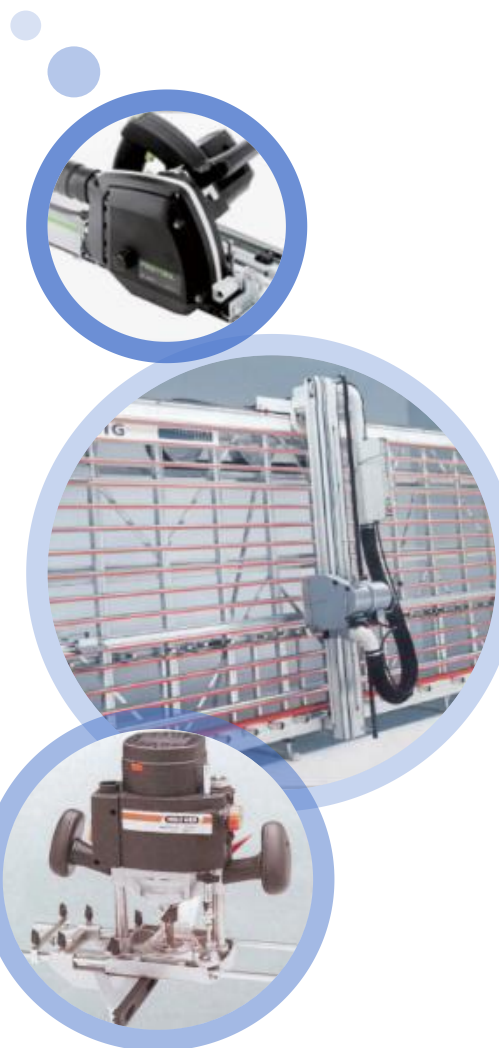
The compelling advantages of this technique include:

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;

三维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；

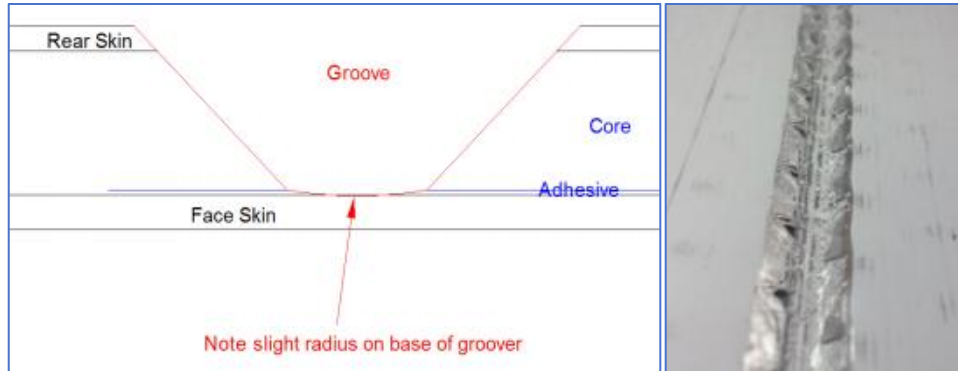


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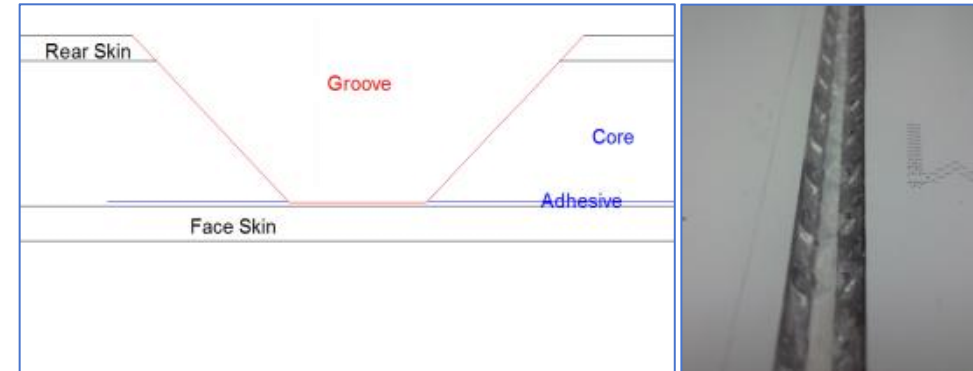
- Grooving 3DPANEL is a simple and easy process - very similar to grooving traditional ACP such as ACP. Traditionally solid core ACP is grooved leaving approximately 0.3mm of core material remaining. The special profiled core of 3DPANEL is slightly more exacting on the groove depth but does not present any issues
 - For a CNC Router, the perfect depth is just brushing the rear of the aluminium face skin. The tooling is the same as that for ACP – a 90 degree V-Groover with a 3mm flat. As depicted in the diagram below, for best results the flat should be adjusted to a slight curve. This is simply done with a finisher or bench grinder. Of course, this tool still works just as well for ACP. Alternatively, a 135 degree V-groover can be used for better swarf removal. If the CNC has a ‘floating head’, it is recommended this be used for easier groove depth control.
 - When using a Festool or Wallsaw, the grooving blade should remove all the aluminium of the core and be touching the adhesive layer on the rear of the face skin. It is important that the tooling be kept sharp as blunt tooling increases heat and pressure on the panel, which in turn can reduce groove quality.
 - The 0.7mm face skin used with 3DPANEL is what enables the groove depth to penetrate the rear of the face skin, while still providing the required corner strength and gentle radius on the fold. If there are concerns the groove has gone too deep and cut into the face skin of the panel, a possible solution is to glue an 'L' angle down the rear of the fold; or in a cassette panel glue the Z Angle to the rear of the panel.
- 3DPANEL开槽工艺简单且易于操作，与传统铝塑板（ACP）的开槽工艺相似。传统上，对于实心核心的铝塑板，在开槽时会留出约0.3mm的核心材料。3DPANEL的特殊轮廓核心对槽深要求稍微精确一些，但不会带来太大问题。
 - 使用CNC雕刻机时，理想的槽深度应恰好接触到铝表面的背部。使用的工具与铝塑板相同，即带3mm平底的90度V形开槽刀具。为了达到最佳效果，平底部分应稍微调整成弧形，可以使用磨带机或台式磨床简单完成。当然，这种刀具也同样适用于铝塑板。或者，也可以使用135度V形开槽刀，以获得更好的切屑清除效果。如果CNC设备具有“浮动头”，建议使用此功能，以便更轻松地控制槽深。
 - 使用Festool或墙锯时，开槽刀片应清除核心材料上的所有铝层，接触到铝表面后部的粘合层。保持刀具锋利非常重要，因为钝刀具会增加面板的热量和压力，从而降低槽的质量。
 - 3DPANEL的铝表面厚度为0.7mm，这种厚度允许开槽时槽深度可以穿透铝表面背面，这样不仅确保了槽角部分的强度，还能在折弯时形成平滑的弧度，而不是锋利的折角。因此，这种厚度可以兼顾到折弯的顺畅性和结构强度。但如果在操作时开槽深度过深，导致槽切入铝表面而可能影响到结构强度，这时可以采取以下补救措施：
 1. 在折弯部分的背面粘贴一个“L”型角钢，这样可以增加折弯处的强度，使得面板更加稳固。
 2. 如果是盒式面板（即有外框的结构），可以在折弯槽的背面粘贴一个“Z”型角钢，进一步增强面板折弯后的支撑力和稳定性。这些措施能够有效弥补由于槽深过深带来的结构强度问题，使得面板在折弯后仍然保持足够的强度。



| Groove And Bend 开槽折弯



CNC GROOVE



FESTOOL GROOVE

Specific details on feeds and speeds

	TOOLING	FEEDS/SPEEDS	COMMENTS
CNC ROUTER	Available from most tooling supplier with 3mm flat. Available from most tooling suppliers.	RPM: 18000 Feed: 8-12m/min	Recommended to curve the flat on the groover slightly
FESTOOL	Standard Festool 90° grooving blade. Use Dibond 4 depth gauge roller.	Speed: 10-15m/min	Groove on a flat even surface to ensure depth accuracy.

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1. If we do not undermine the surface of the aluminum when grooving, the bending force will be uniform when the aluminum skin, aluminum will naturally form a curved 90° bending angle. In this case any kind of paint will not crack
2. However, it is required to remove all the middle core material, otherwise the Angle surface will appear uneven after bending.

1. 如果在开槽时不破坏铝表面的完整性，铝皮在弯曲时所承受的力将是均匀的，这样铝会自然形成一个90度的弯角。在这种情况下，任何类型的涂料都不会开裂。
2. 然而，必须完全去除中间的核心材料，否则在弯曲后，角部的表面会出现不平整的情况



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When grooving the back side of the 3DPANEL, if the groove cuts too deeply into the back of the aluminum skin, it may lead to uneven stress distribution during bending. This can result in a 90-degree bend occurring around the grooved side as the center line. In such cases, some paint coatings may lack sufficient elongation properties, leading to cracks in the paint.

在三维板背面开槽时，如果正面铝皮背部被切入太深，弯折时可能造成受力不均匀，将以开槽一侧为中心线形成90度角弯曲。这种情况下，部分颜色的油漆涂层没有足够的拉升力而出现裂纹。

