

ALPOLIC NC Processing Manual

1. Processing method

(1) Cutting/ Saw

ALPOLIC™ NC can be easily cut using standard woodworking saws (i.e. circular hand saw or panel saw).

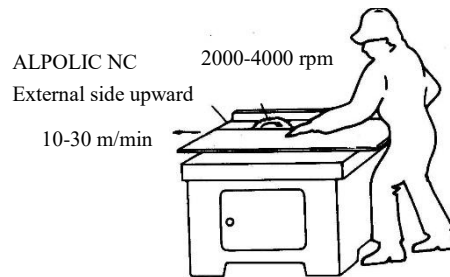
A carbide tip blade made for a light metal is suitable for cutting ALPOLIC™ NC

Example of suitable saw blade:

Blade diameter	255 - 305 mm
Number of teeth	80 - 100
Cut width	2.0 - 2.6 mm
Rake angle	10°
Tip	Carbide

Operating conditions

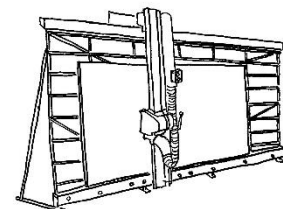
Spindle of circular saw blade	2000 - 4000 RPM
Feed rate	10 - 30 m/min



Circular hand saw

Notes on saw cutting:

- Do the cutting operation with the external side facing upward to prevent the panel from scratches and the protective film from peeling off.
- Remove cutting chips from ALPOLIC™ NC carefully after cut, to avoid dents during storage and assembly.
- Sharpen or replace the saw blade, when it becomes dull. Dull blades will result in a large burr or distortion at the cut edge.
- Due to high mineral content in the core, the blade life is shorter than cutting other ALPOLIC™s.



Panel saw

(2) Cutting/ Shear

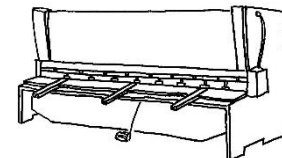
Square shear cutting is the easiest method for cutting large panels. Some shear droop or rolled edge may result at the cut part of the surface aluminum.

Recommended clearance and rake angle for shear cutting is as below.

Clearance	0.04 - 0.1mm
Rake angle	1° 30'



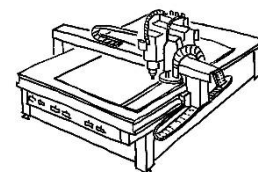
Cutting by shear



(3) Cutting/ CNC router

We can also use CNC router for profile cutting ALPOLIC™ NC panels.

Complicated profile cutting as well as straight cutting is possible with CNC router. Use square end mill tools made of solid carbide.



CNC router

(4) Grooving/ CNC router

We recommend a CNC router only for grooving for precise grooving depth. The remained thickness should be between 0.55 to 0.65 mm including protective film thickness. The correct depth range is very limited, ensure The bed is regularly “skimmed” to maintain precise depth.

Notes on grooving:

It is not recommended to use conventional panel saws or hand grooving machines on site as it will be difficult to control precise groove depth.

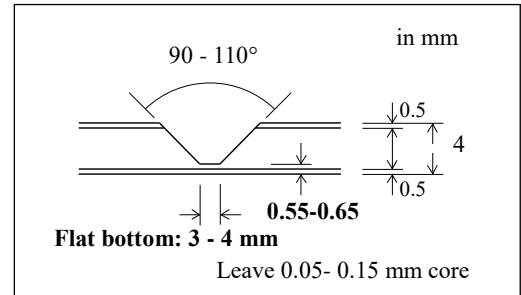


Grooving with CNC router

This could lead to slight surface distortion if depth is incorrect.

U-groove shape

The diagram on the right shows a typical U-groove shape suitable for folding ALPOLIC™ NC panels. It is important to leave 0.55 to 0.65 mm thick in total on the grooves including protective film. We recommend 90 to 110° angle grooves with 3 to 4 mm flat bottom for 90° bending.



Typical U-groove shape

Operating condition of CNC router

A CNC router enables efficient and precise grooving. Typical conditions are as follows:

Router bit

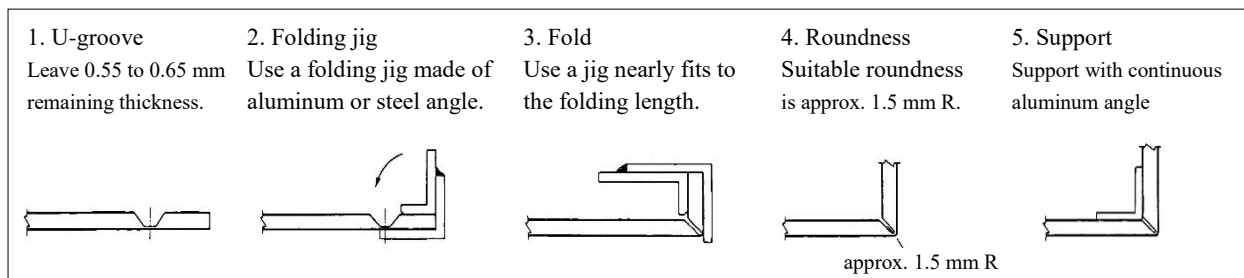
Number of teeth	2 - 4
Material	Carbide tip

Operating conditions

Spindle	12,000 - 24,000 RPM
Feed rate	5 - 8 m/min.

(5) Folding and assembly

After U-grooving, we can fold ALPOLIC™ NC with a folding jig. The typical folding procedures are as follows.



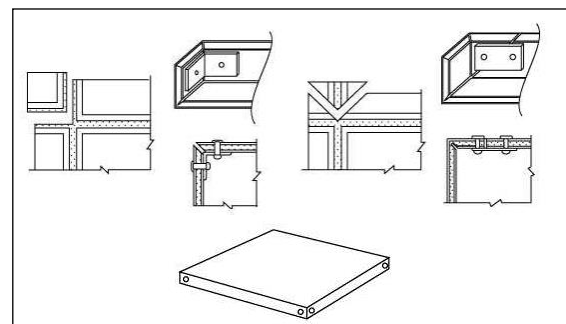
Folding procedures

Notes on folding:

- Fold ALPOLIC™ NC panels on a flat and rigid worktable.
- The folded corner should have a suitable roundness of approx. 1.5 mm in radius. If the roundness is too small, the coating may have a crack on the folded corner. Check your U-shape and grooving depth.
- Cracks may take place when we carry out the folding work at a low temperature. Have your folding work at 10°C or higher.
- Folding after U-grooving entails slight elongation. The elongation is 0.5 - 1.0 mm per fold. Pre-adjust the position of the grooving line in your fabrication drawing.

Assembly

To produce a tray type panel (rout & return panel), we normally groove the panel at 25mm from edges, remove the four corners by notching tool and fold the four sides. After assembly, the corners are sealed with sealant from backside to prevent from water penetration, if necessary.



Assembly after grooving

(6) Drilling, punching and notching

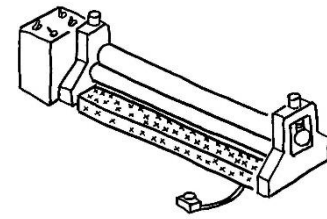
ALPOLIC™ NC can be processed in the same manner as other ALPOLIC™s by conventional tools or machines. Please refer to ALPOLIC™ Technical Manual for the details.

(7) Bending

Bendability of ALPOLIC™ NC is limited larger radius only.

Bending with 3-roll bender

We can use 3-roll bender for curving ALPOLIC™ NC panels. The smallest bendable radius is approx. 2500 mm R. The gap between rolls should have some allowance (approx. 0.5mm) in order not to constrict ALPOLIC™ NC panel between rolls. Please refer to ALPOLIC™ Technical Manual for further details.



3-roll bender

Note: Bending for small radius by means of press brake is not applicable due to less flexibility of the high mineral content core.

(8) Other processing methods

Turret puncher: It is applicable for making fastening holes prior to assembling.

Note: A perforated panel or an exposed cut-edge application is not applicable for ALPOLIC™ NC.

Water-jet cutting: A plunge cut (piercing at the starting point) in water-jet cutting may cause a certain degree of de-lamination between the aluminum skin and the core material.

Laser cutting: According to our tests, we have so far concluded that ALPOLIC™ NC is not suitable for laser cutting.

(9) Safety precautions on fabrication works

- a. The panel edge is sharp and burred. Wear gloves for safety in handling ALPOLIC™ NC.
- b. During working with CNC router, wear safety glasses for protection of eyes.
- c. If machinery does not have dust extraction, respirators should be used.

2. Joining methods

Joining methods can be followed in the same manner to ALPOLIC™s except the non-penetrating riveting method (acro-rivet system) and core welding. Please refer to ALPOLIC™ Technical Manual for further details.

3. Handling and storing

Refer to the ALPOLIC™ Technical Manual.

4. Cleaning

Refer to the separate cleaning instruction in ALPOLIC™ Technical Manual.

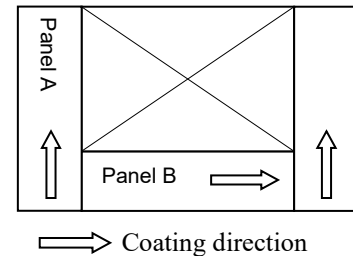
5. General notes (Very important!)

(1) Color consistency

For best color consistency, consider and maintain panel directionality during all stages of job planning, fabrication and installation. Material should be ordered at one time and one width and lots should not be combined.

(2) Coating direction

In Metallic Colors, Sparkling Colors, Prismatic Colors and Patterns (Stone, Timber, Metal, and Abstract), slight color differences will be noticeable if the panels are installed in different directions (like Panel A and B in the diagram). Install panels in the same direction as marked in the protective film. In our Solid Colors, any color difference due to coating direction is negligible.



(3) Protective film

The protective film on ALPOLIC™ NC consists of two layers of co-extruded white and black (removable self-adhesive protective film). Do not peel off the protective film during fabrication and installation to protect the surface from scratching and soiling. Under normal weather conditions, the protective film will withstand 6 (six)-months of outdoor exposure without losing any of its original peel-off characteristics or causing stains or other damage. However, peel off the protective film as soon as possible after completion.

(4) Gloss increase due to plasticizer

Do not stick, put or apply PVC tapes, polyurethane sealant or modified silicone sealant onto our protective film. The plasticizer contained in these materials can permeate the protective film and cause a gloss change in the coating.

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