Reynoplate®

Hoover™ Architectural Solutions

3MM PLATE USER GUIDE





BUILD BOLDER.

Reynoplate® 3mm mill finish or coil-coated aluminum plate from Hoover Architectural Solutions is a high-performance, non-combustible solid aluminum panel that combines cost-effectiveness with outstanding sustainability. Perfect for both low- and high-rise applications, it is designed to withstand the demands of high-traffic projects across a variety of sectors. Constructed from a 3000 series aluminum alloy, Reynoplate® panels are available in widths up to 72" and lengths up to 196", with a lightweight design of 1.7 lbs/ft².



3mm (0.118") Aluminum plate

The fabrication guidelines in this document are general techniques to consider when fabricating 3mm Reynoplate®. Due to the various configurations of machinery and tooling used in the aluminum converting industry it is imperative to perform testing in order to find the best solution for your particular situation. Though Hoover Architectural Solutions does not guarantee optimal results with the following guidelines, these are a good starting point to determine your most favorable production parameters.

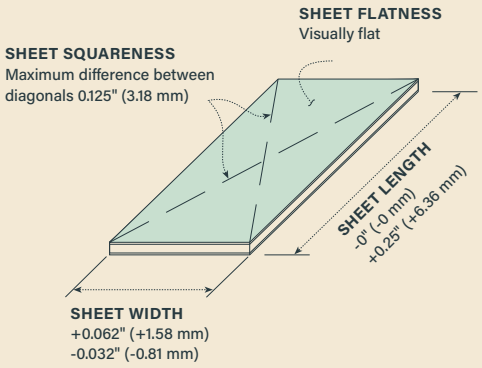
STORAGE & HANDLING

Reynoplate® 3mm plate is cut to length at the manufacturing facility and is packed on wooden skids. These skids are banded in both directions in order to minimize movement during shipment.

Also, the panels and sheets should be handled with caution from multiple locations along their length and should be protected from other materials during the fabrication process.

Panels should always be protected from other dissimilar metals with a barrier of some sort in order to minimize galvanic reactions.

FIGURE 1
MANUFACTURING TOLERANCES

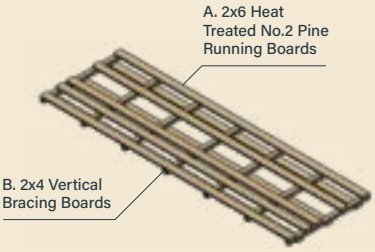


REYNOPLATE® CUTTING

A number of options are available for cutting 3mm plate such as shearing, CNC endmill cutting, or table saw as well as plasma or water jet cutting. The most common option would be using a stationary table saw or specialized panel saw configuration. Sawblade selection will be a critical factor when it comes to the quality and speed of cut. Typical carbide tipped saw blades 8" to 10" in diameter with 60 to 80 teeth should be used as a starting point for blade selection. Saw blade RPM and feed rate will be dependent on several factors such as machinery type and lubricant/coolant use. CNC router cutting should be done using a single flute upcut carbide milling bit for best results a lubricant should be utilized, and a test run performed to understand feed rate and spindle speeds for your particular machinery set up.

FIGURE 2&3
STORAGE & HANDLING

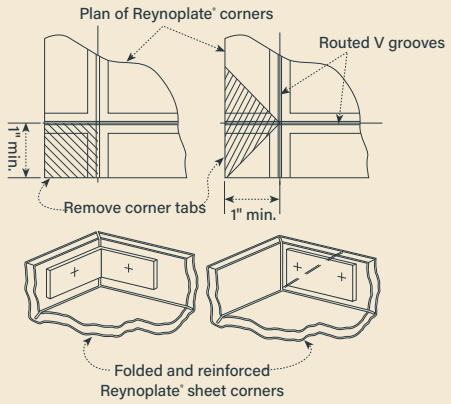




ROUTING

Routing 3mm Reynoplate® can be achieved with similar techniques as routing ACM material with adjustments to spindle speeds, feed rates, and lubricant/coolant use. When routing 3mm sheet to create folded edges no less than 0.032" (0.7mm) should be left in the routed section this will achieve a sharp folded edge. V-groove routing bits should be between 90° to 135° and have at least a 1/16" wide flat nose. By varying the angle of the v-groove routing, it is possible to achieve different bend angles that may be necessary. In regards to proper bit selection this will vary according to machinery setup. Carbide tipped milling bits tend to provide a quality finish and exhibit long tool life. Lubricant use will also greatly enhance the fabrication process and extend tool life.

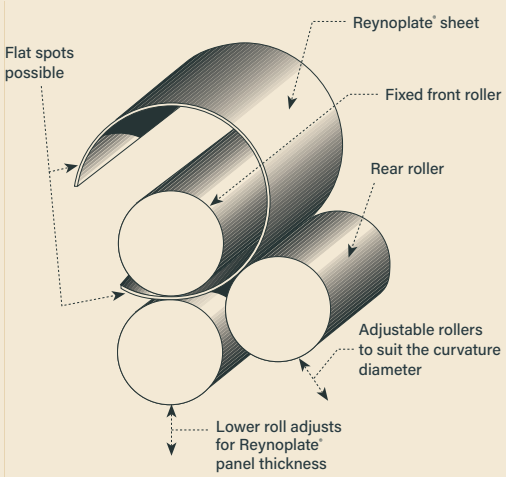
FIGURE 4
PANEL ROUTING & LAYOUT



ROLL FORMING

Roll forming processes are similar to that of Reynobond® ACM this can be achieved using a pyramid roller device. An inner bending radius of 6 in is recommended for Reynoplate® 3mm aluminum sheet.

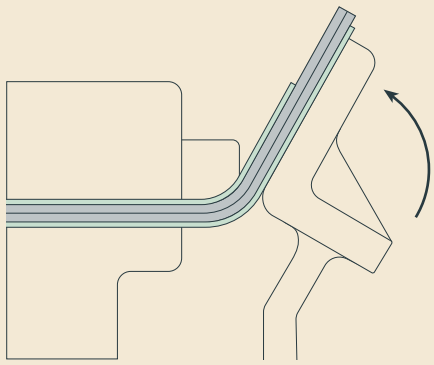
FIGURE 5
ROLL FORMING



BENDING/FOLDING

Bending and folding 3mm Reynoplate® can be achieved with methods similar to that of Reynobond® ACM with adjustments to pressure applied. It is possible to achieve 90° folds like that of Reynobond® ACM when material left in the routed groove is kept at 0.032 inch (0.7mm). When bending Reynoplate® material that has not been routed a 2.5T inner bending radius should be maintained in order to minimize finish crazing.

FIGURE 6
BENDING



THERMAL EXPANSION

When fabricating 3mm Reynoplate® panels particular consideration should be taken in regard to thermal expansion. Thermal movement is particularly important to not put excess stress on fasteners and to prevent unacceptable panel bowing and distortion.

THERMAL MOVEMENT EXAMPLE – EXPANSION

Example Panel Size: 10' x 4' @ 68°F (panel skin temp)

Coefficient of thermal expansion: 1.28 x 10^-5 in/in x °F. With an increase in panel temperature of from 68°F to 180°F panel expands from a length of 120" to 120.18".

Length Expansion Calculation: (0.0000128 in/inx°F)(120 in) (120^°F) = 0.18" With an increase in panel temperature of from 68°F to 180°F panel expands from a width of 48" to 48.059"

Width Expansion Calculation: (0.0000128 in/in x °F)(48") (120^°F)=0.074" Notice in the above example that thermal expansion has a direct correlation to size of the panel (ie. Larger panel means more expansion) this must be considered when dealing with large areas of Reynoplate® panels.

THERMAL MOVEMENT EXAMPLE – CONTRACTION

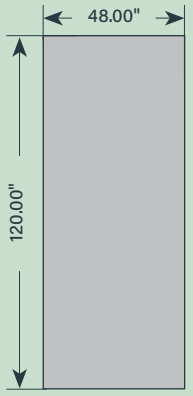
Example Panel Size: 10' x 4' @ 68°F (panel skin temp)

Coefficient of thermal expansion: 1.28 x 10^-5 in/in x °F. With a decrease in panel temperature of from 68°F to -40°F panel contracts from a length of 120" to 119.83"

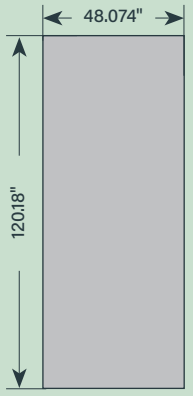
Length Contraction Calculation: (0.0000128 in/in x °F)(120 in) (-108 ^°F) = - 0.17" With a decrease in panel temperature of from 68°F to -40°F panel contracts from a width of 48" to 47.93"

Width Contraction Calculation: (0.0000128 in/in x °F)(48 in) (-108^°F) = -0.07" As noted with thermal expansion, contraction must also be considered when dealing with large spans of Reynoplate® panels.

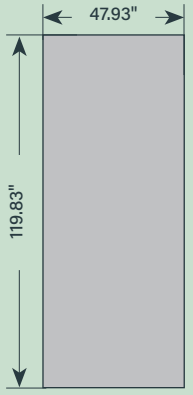
The above examples are based on the extremes of the panel's temperature resistance being between -40°F to 180°F however any temperature range can be calculated depending on environment.



Original Panel Size at
68°F skin temperature



Thermal Movement – Expansion
112°F skin temperature increase
from 68°F to 180°F



Thermal Movement - Contraction
108°F skin temperature decrease
from 68°F to - 40°F

WELDING GUIDELINES

Reynoplate® 3mm aluminum plate can be welded using normal welding practices such as TIG (tungsten inert gas) and MIG (metal inert gas) welding techniques. TIG welding will typically produce the most aesthetically pleasing and structurally sound results. Welding using a metal inert gas (MIG) setup will still produce great results and is typically faster than TIG welding techniques. Welding is not recommended on coil-coated Reynoplate® as the finish warranty will be affected. Welding is only recommended on our Reynoplate® Mill Finish. Below is an example of parameters for welding Reynoplate® 3mm aluminum. Hoover Architectural Solutions products do not guarantee satisfactory results with the following welding parameters.

TIG

Filler Rod Size: 2.4 or 3.2 mm diameter

Electrode Size: 2.4 or 3.2 mm diameter

Filler Alloy: 1100 & 4043 for welding 3003 Alloy to 3003 Alloy

Shielding gas: Argon

Shielding gas flow rate: 10 L/min

Amperage: 110A – 130A

Welding Speed: 150-200 mm/min

MIG

Filler Wire Size: 0.8 - 1.2 mm diameter

Filler Alloy: 1100 & 4043 for welding 3003 Alloy to 3003 Alloy

Shielding gas: Argon

Shielding gas Flow rate: 20 L/min

Amperage: 120A – 140A

Arc Voltage: 13-15 V

Welding Speed: 450 – 550 mm/min

PERFORATION GUIDELINES

3mm Reynoplate® makes for a good substrate to use for perforated design applications. Perforation can be achieved using typical metal punch tooling such as turret presses. CNC machining is also an option for perforating 3mm plate and will provide more aesthetically pleasing results. Tooling selection will be very similar to that of what would be used to cut Reynoplate®, a single flute carbide tipped milling bit will provide optimal results.

- Perforation should not be fabricated on panels being used in adverse environments such as near salt/brackish water or in areas with high air pollution (near power plants/ manufacturing facilities)
- Particular consideration should be taken in regard to expansion joints.
- Punching of material may produce a shiny exposed aluminum appearance caused by shearing

REYNOPLATE® FINISHES

Reynoplate® 3mm Aluminum plate is coil coated via a continuous roll coating process. Our 70% polyvinylidene fluoride (PVDF) finishes offer high durability and superior performance. Reynoplate® two coat finishes typically consist of a 0.2 mil primer coat and a 0.8 mil top coat resulting in a nominal dry film thickness of 1.0 mils. Due to the coil coating process directionality of the material must be maintained during installation especially when Reynoplate® is coated in a metallic or mica finish to ensure there is no shade difference from the viewing axis. It is important to note that when ordering Reynoplate® for a particular project, the color may vary between different production lots. If possible, purchase all of your needed single-color family orders from the same lot in order to avoid any color variation.

Bone White	Cadet Gray	Charcoal	Classic Bronze
Deep Black	Pure White	Anodic Clear	Pewter
Silversmith	Sunshine Gray	Bright Silver Metallic	Champagne Metallic



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