REYNOPLATE®

Reynoplate® 3mm Plate User Guide

Arconic
Architectural
Products

Build **Bolder.**

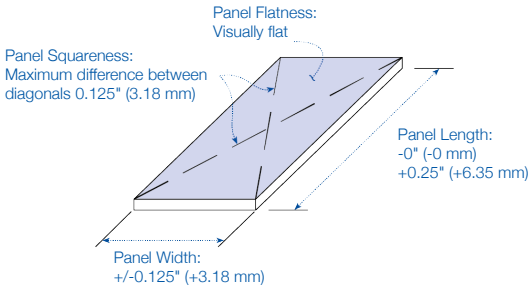
General

Reynoplate® 3mm mill finish aluminum plate from Arconic Architectural Products LLC 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 168”, with a lightweight design of 1.7 lbs/ft².

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. Arconic Architectural Products LLC does not guarantee optimal results with the following guidelines but a good starting point to determine your optimum production parameters.

FIGURE 1

Manufacturing Tolerances



Storage & Handling

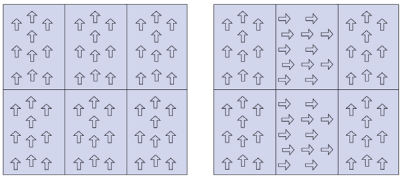
Reynoplate® 3mm plate is cut to length at the manufacturing facility and is packed on cushioned wooden skids. These skids are banded in both directions in order to minimize movement during shipment.

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.

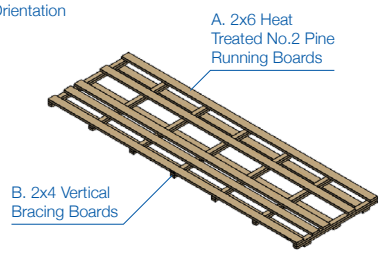
FIGURE 2&3

Storage & Handling



Correct Orientation

Incorrect Orientation



Reynoplate® Cutting

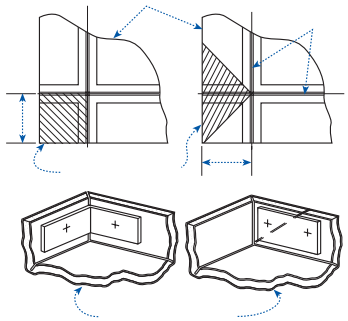
A number of options are available for cutting 3mm plate such as shearing, cnc endmill cutting, or table saw as well as plasma or water jet cutting. The most common option would be using a stationary table saw or specialized panel saw configuration. Sawblade selection will be a critical factor when it 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.

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 but carbide tipped milling bits tend to provide a quality finish and exhibit long tool life. Lubricant use with also greatly enhance the fabrication process and extend tool life.

FIGURE 4

Panel Routing & Layout

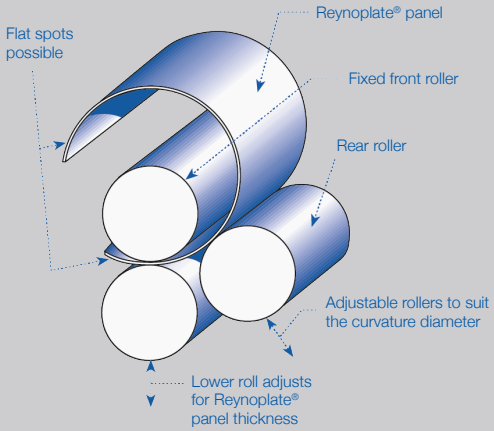


Roll Forming

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

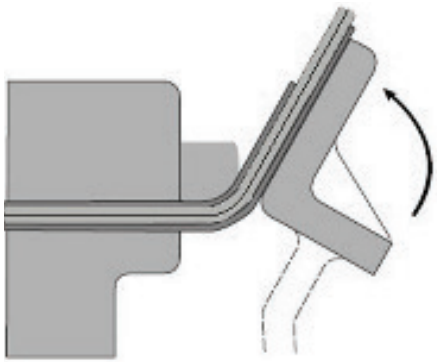


Bending / Folding

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 avoid 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’ @ 68oF (panel skin temp) Coefficient of thermal expansion: 1.28 x 10^-5 in/in x oF. With an increase in panel temperature of from 68oF to 180oF panel expands from a length of 120” to 120.18”. Length Expansion Calculation: (0.0000128 in/inxoF)(120 in)(120^oF) = 0.18” With an increase in panel temperature of from 68oF to 180oF panel expands from a width of 48” to 48.059”

Width Expansion Calculation: (0.0000128 in/in x oF)(48”) (120^oF)=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’ @ 68oF (panel skin temp) Coefficient of thermal expansion: 1.28 x 10^-5 in/in x oF With a decrease in panel temperature of from 68oF to -40oF panel contracts from a length of 120” to 119.83”

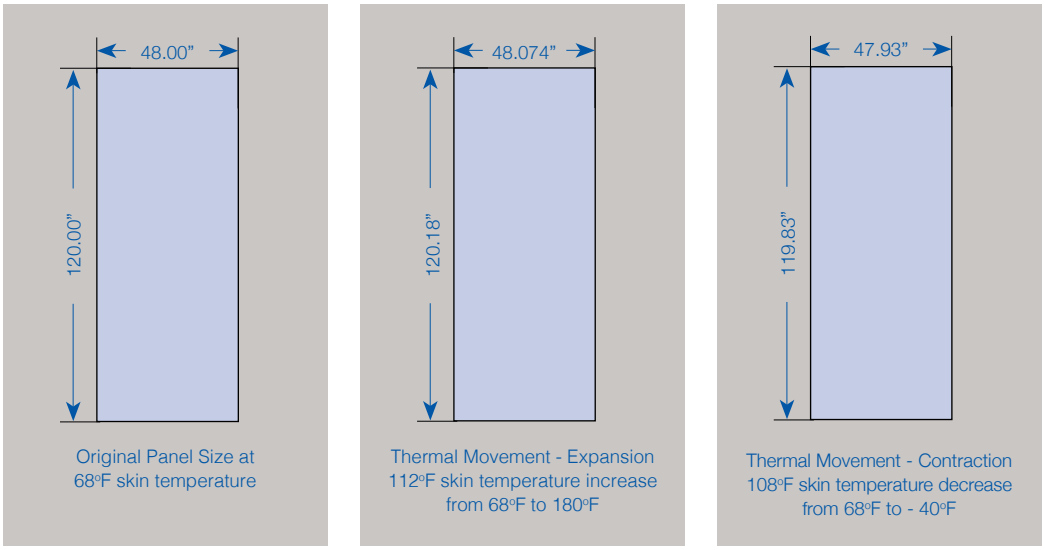
Length Contraction Calculation:(0.0000128 in/in x oF)(120 in)(-108 ^oF) = - 0.17” With a decrease in panel temperature of from 68oF to -40oF panel contracts from a width of 48” to 47.93”

Width Contraction Calculation: (0.0000128 in/in x oF)(48 in)(-108^oF) = -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 -40oF to 180oF however any temperature range can be calculated depending on environment.

FIGURE 7

Expansion



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. Arconic Architectural products does 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

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 that the color may vary between different production lots, if possible order all a of single color family from the same lot 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

Westside Paper – Atlanta

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 can be performed using Standard punch tooling or CNC routing.
- A minimum of 5/16” (8mm) from panel edge to first perforation edge.
- Minimum perforation spacing of 5/16” (8mm) between outer edge of each perforation.
- Perforations larger than 5/16” (8mm) must have a spacing equal to the diameter of the perforation.

Ex 1. A perforated hole less than 5/16” in diameter must maintain a minimum spacing of 5/16”

Ex 2. A 1” diameter perforated hole must have a minimum spacing of 1” from outer edge of perforation to the next outer edge.

- 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

FIGURE 8

Perforation