

TECH TALK

Product: Dibond® **Date:** February 14, 2005
Subject: Making Corners **Revision:**
Number: D23 **Pages:** 10

“After the V-Rout, What’s Next? – Let’s Make a Few Corners.”

Overview:

An aluminum composite panel requires a “grooving” operation along any fold line prior to bending. This operation can be done with a custom saw blade or a customized router bit. Regardless of the tooling used the groove is commonly called a “rout”. The most common rout is a modified “90° V” with a flattened (1/8” wide minimum) bottom. The reason for this modification is so that the aluminum skin does not overstress during the bending process. Once correctly done, this V-Rout allows the composite panel to be folded along the rout from 0° to 90° easily. The term “Rout and Return” means that a panel has been routed and the edge returned or folded.

A rout made with profiles other than 90° allows the panel to be bent to various angles. These profiles eliminate fabrication problems and combine to create different joining techniques. Two additional common router profiles discussed in this document are the 135° and the Flat rout.

Common 90° V-routed Corner

The most common corner is a 90° Rout and Return. This corner is made by folding a V-routed panel to a 90° angle.

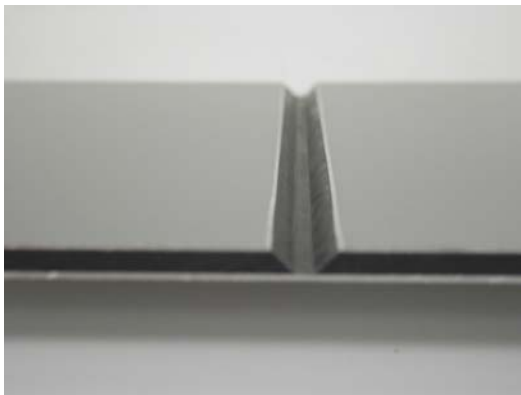


90° V-Router Bits & Blades



Folded V-Routed Corner

It is critical that the modified V-rout is made to the correct depth to create a good return angle. “Spring back” will occur if the rout is not deep enough, however, extreme care should be taken not to score the exterior aluminum skin with the router bit or blade during the routing operation so that the aluminum skin is not weakened. The depth is correct when the exterior skin is intact with approximately 1/64” of polyethylene in the bottom of the V-rout and the return does not “spring back” when folded.



Modified V-Rout in Dibond®

Multiple 90° Corners

The solid core of Dibond® allows the panel to be routed at any location. Wherever a fold is required, a rout can be made. Rout, notch, fold and reinforce with a gusset (back-up plate), and a “dimensional” panel can be easily made.



Flat Panel Routed and Notched



Panel Folded and Gusseted

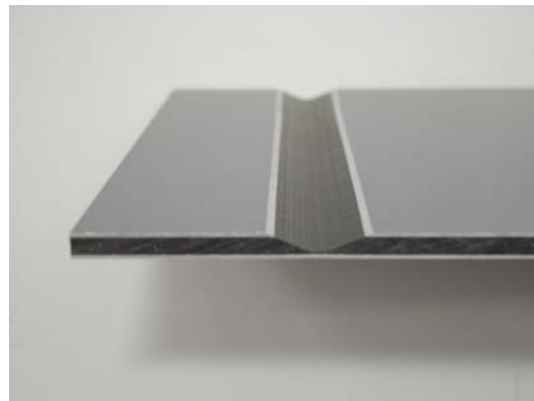
The gusset shown is made from Alucobond® material. Gussets can also be made from solid aluminum sheet stock. Regardless of the material used to make the gusset, the corner should be trimmed so it will not interfere with the folded corner.

135° Profile

This profile allows the panel to be folded to a 45° angle. This is useful when it is necessary to join two panels at a 90° corner.



135° Router Bit and Saw Blade



Modified 135° Rout in Alucobond®



Two 45° Corners Riveted to Make a 90° Corner

90° Corner with Sawed Relief Cuts

A rout and return curved corner requires the curved portion of the return to be relieved to allow the panel to curve. These “relief” cuts can be made with a router or a saw cut. They must be done carefully to prevent “bumps” being visible at the end of the relief cuts and showing on the exterior of the panel. The pictures below show this type of corner reinforced with a gusset and the “bumps” visible along the curved edge.



Curved Panel with "bumps"



Gusset Shown (Inside View)

90° V-Routed and Trimmed

There are instances when the “return” is trimmed or removed flush with the back of the panel. One example is when a rout and return panel is fabricated into a curved panel. This method allows the outer skin of the Dibond® to be rolled without distortion. The panel is first V-routed and the return is removed at the correct location. The panel is then curved and the return reinforced with a gusset. A filler plate has been added to form a Rout and Return Corner panel. This method eliminates “bumps”.



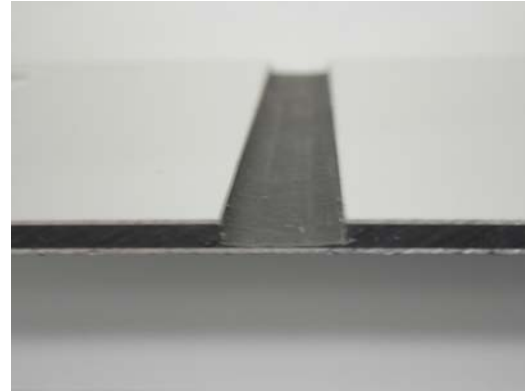
Corner Panel With Gusset and Filler Plate

Flat Routed Corner

This routed profile can be made with tooling of various widths. Once made, it allows the corner to curve gently and not be as sharp as the 90° V-rout.



Flat Router Bit and Saw Blade



Flat Routed Alucobond®



Alucobond® Corner with Flat Rout

Flat Rout Distorted to Eliminate “bumps” in Rout and Return Curved Corner

The Flat Rout can also be folded anywhere within the “flat rout” to create a sharp 90° bend. This sharp 90° bend is sometimes used in the fabrication of a rout and return curved corner panel to eliminate the "bumps" at sawed relief cuts. The panel below has a gusset for reinforcement.



Distorted Flat rout folded 90°



Curved Corner

Flat Rout Used to Make a “Hem and Cope”

The only time a rout is set to a depth to remove the entire core material is when a “Hem” or “Cope” is needed. Both are made using a flat rout. A cope makes a support (sometimes called a rabbet joint) at the edge of the panel. It is generally routed to the same width as

the panel thickness. A hem is made by first cutting a cope and then bending the remaining skin over the core material. These two flat routed conditions can be used independently or together to solve many fabrication needs.



Cope at Edge of Panel



Folded Cope (A Hem)



Curved Corner Panel Using a Cope



Curved Corner Panel - Hem & Cope

This Tech Talk has been developed to transmit information and assist fabricators to work with Dibond[®] material in the most efficient and effective manner. The data contained in this Tech Talk is based on information that is, in our opinion, reliable. However, since skill, judgment, and quality of equipment and materials is involved



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