

TITLE: Guide to Cutting Aluminum

Category: Routers – How To

Gerber FastFact #: 5049

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Summary: This document explains how to cut aluminum on your Gerber Router.

Underlined text indicates change from the previous document.

Aluminum is an attractive and durable material for interior and exterior signage. Cutting aluminum on your Gerber Routing system is not difficult. With some extra attention given up front, aluminum will cut very nicely on your Gerber routing System.

Materials: Gerber Routing systems are very efficient at cutting aluminum. However, there is a lot of confusion as to which type of aluminum works best. The following is some basic information to assist you in your selection of aluminum.

Numerical Designation: Aluminum is categorized by type. The type is identified by a stamp of marking in one side of the aluminum sheet. There are eight different series available starting with a 1000 series through an 8000 series. Usually the type, or alloy, is specified by a four digit number followed by a T number. The first two digits represent the series aluminum and the last two digits represent the different alloys that make up that series of aluminum. The T number identifies the Temper, or heat treatment process involved.

Heat-Treatment and the T Number: The strength of aluminum depends on the heat treatment of the alloy composing that series. Aluminum in the 1000,3000,4000, and 5000 series are non-heat treatable. Generally when non-heat treatable alloys are subjected to high speed machining they will heat up quickly and cause melting and possible tool damage.

Heat treatable alloys are listed as 2000, 6000, 7000, and 8000 series. The type of aluminum you choose to Rout is very important. The soft grades of aluminum are more likely to give poor results. Grades 6061-T6 and 2024-T3 work the best and are widely available in sheet form.

Solid Carbide Router Bits are recommended for all your aluminum cutting needs. Always use the shortest and largest diameter bit possible to minimize vibration and to give the best results.

Aluminum Setup:

Remove the vacuum shroud pressure foot assembly as it won't be needed while cutting brass.

For small letters and shapes set up the aluminum on your Router use a sacrificial material that has a high density. Extra pieces of acrylic stock works well. Avoid using press board type material as a sacrificial. It will absorb the mist coolant and release the double sided tape reducing your hold down effectiveness. To hold the aluminum sheet to the sacrificial use a high tack, solvent resistant double faced tape. Avoid foam filled tapes as they do not hold the material rigid. Place strips of tape on the sacrificial sheet in such a way to ensure the centers of shapes will be held securely. If you are using a very thin aluminum, a spray adhesive may be used as removing the double sided tape may damage the finished shape. Thoroughly clean the aluminum sheet and use firm pressure to ensure a good bond between the aluminum and sacrificial.

When cutting larger shapes, you can use Gerbermask II tape and apply to the back of the aluminum and “cut to mask” as you would any other material.

Safety Note: *It is important to insure the all shapes are properly secured to the table using double sided tape or Gerbermask to insure that inside shapes or small shapes do not get caught on the bit and get thrown off the table or affect the quality of cut.*

System Setup:

When cutting Aluminum, mist coolant must be used. Coolant keeps the tool cool and lubricated and will extent tool life. Refer to the Manual that came with you mist coolant system for type of coolant and mixing ratios needed. Or refer to Fastfacts # 5011 for information on mist coolant.

You may use the T-VAC table to hold down the material to the table. Or if needed clamp the material clamp the material to the table using the clamps provided. Place the clamps evenly around the work piece and tighten securely to reduce vibration. Use as many clamps as possible. Keep the clamps as close to the cutting area as possible when cutting a small area in a large sheet.

Speeds and Feeds:

The following speeds and feeds are recommended values only. With experience you may find the faster speeds are possible. You will find that all values are dependent on bit used, material grade and quality, and hold down techniques. It is recommended that you do a series of test cuts to find the optimum speed and feed. More Information can be found in the Owners manual of your Gerber Routing System.

Material Thickness	Bit Size	Depth per pass	Feed Rate (IPM)	Plunge (IPM)	RPM
1/8" (.125)	1/8" (.125)	.125	15	10 IPM	19,000
1/4" (.250)	1/8" (.125)	.125	20	10 IPM	19,000
1/8" (.125)	1/4" (.250)	.125	30	10 IPM	19,000
1/4" (.250)	1/4" (.250)	.125	35	10 IPM	19,000