

# maxmetal<sup>TM</sup>

## Fabrication Guide



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# MAX-METAL FABRICATION GUIDE

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# || GENERAL HANDLING & STORAGE

## General Handling:

1. Carrying MAX-Metal is best done with two people. Position the sheet on its side (vertically) and pick up from each end. *See Fig 1 Below.*
2. DO NOT pick up the sheet horizontally (lying flat) as it will bend or warp the sheet. *See Fig 2 Below.*
3. When removing sheets from a pallet or stack, never drag the sheet as it can scratch the sheet below it. Lift the sheet clear of the remaining sheets on the stack.

Figure 1



Figure 2



4. Handling MAX-Metal with a forklift requires a pallet that is in good shape. Picking up a pallet of MAX-Metal from the end of the pallet is not recommended as it could cause bowing of the sheets if the forks/fork extensions are less than 8'. It is recommended to pick up the pallet from the side to help better support the material. *See Fig 3 Below.*

Figure 3



## Storage:

1. Proper Storage requires lying the MAX-Metal panels horizontally/flat on a good pallet or in a proper vertical rack. If storing sheets vertically, ensure that they are straight up/down, not at an angle, which will cause bowing of the sheet.
2. Full pallets of MAX-Metal are packaged in wooden crates and can be stacked up to 4 crates high.
  - a. Use best judgement to ensure the crates are stable before leaving the stack unattended.

# || PRINT OPTIMIZATION

## Preparation:

### 1. Surface Preparation:

- a. Our Easy-To-Peel Protective Masking ensures no residue is left on the panel, reducing cleaning time and eliminating the risk of interference with the print.
- b. Always wear clean cotton gloves when handling sheets after masking has been removed.
- c. If surface cleaning is deemed necessary, it is recommended to use a soft cloth and 90%+ Isopropyl alcohol.

### 2. Digital Printing:

- a. MAX-Metal has a line of Digital Printable (DP) products, which incorporate a print optimized surface for industry leading ink adhesion.
- b. Each Digital Flatbed printer utilizes different color profiles that not only control the color and vibrancy of the ink, but also controls the density of the ink being printed on the panel. Please select the profile that your printer manufacturer recommends for ACM panels.
- c. If additional adhesion is required the use of an adhesion promotor can be applied to the sheet prior to printing.

### 3. Screen Printing:

- a. MAX-Metal is perfect for printing with an epoxy base or urethane base two-part type ink. When selecting an ink, confirm its weather ability and adhesion with the ink manufacturer. It is recommended to test the ink adhesion on the surface of MAX-Metal before printing.

### 4. Painting:

- a. Surface should be lightly abraded to provide a better coating surface. The Surface should then be cleaned of all contaminants i.e. dust, dirt and oil etc. A soft cloth with a non-petroleum based solvent or Isopropyl alcohol should be used to clean the surface area.
- b. Recommended paint types are Urethane and Enamel based paints.
  - i. Urethane paint is widely used in the sign industry (i.e. Matthews, Akzo-Nobel)
  - ii. Enamel paint is widely used in the sign industry (One-Shot Lettering Enamel)
- c. The factory surface of painted MAX-Metal sheets is a Polyester paint system.

**\*\*Contact your paint manufacturer to select the correct paint for your application\*\***

# || CUTTING INSTRUCTIONS

Material	Tool Type	Blade Recommendation	Blade Specs	Max Cutting Speed	Max Cutting Feed Rate
Aluminum Composite	Circular Saw (Table Saw, Panel Saw or Portable Circular Saw)	Aluminum Cutting Blade Carbide tipped	Maximum number of carbide teeth available is recommended. i.e. Oshlun 60 Tooth was used during testing and yields excellent results.	5500 RPM	40 mm/sec
Aluminum Composite	Band Saws	Tempered Spring Strip Steel	Thickness: 0.8 mm to 1.2 mm Width: 15mm to 25 mm Use ratchet or straight set	10000 RPM	25 mm/sec
Aluminum Composite	Reciprocating Saw	High Speed Steel	Thickness: 0.8 mm to 1.2 mm Width: 5 mm to 15 mm	n/a	10 mm/sec
Steel Composite (MAX-Metal Element)	Circular Saw (Table Saw, Panel Saw or Portable Circular Saw)	Steel Cutting Blade	Ferrous/Steel Cutting Blade. Maximum number of teeth available is recommended. i.e. Diablo D0770F 70 Tooth Steel Blade was used during testing and yields excellent results.	5500 RPM	30 mm/sec

*\*All recommendations are considered guidance based on testing. Please carry out your own testing for optimal results.*

## Jig Saw:

Jig saws work well for cut-outs. Care should be taken with portable jig saws to prevent damage to the MAX-Metal material surface. More than one sheet can be cut at a time by stacking panels. If center cutting (i.e., letter cutouts) is required, a foam pad may be placed under the material with the blade cutting into the foam. The sheets may be clamped or secured with double-sided tape for the cutting operation. When clamping between jaws, protect the panel surface against damage.

# ROUTING INSTRUCTIONS

## Basic Settings:

Recommended Basic Settings for 3mm MAX-Metal ACM:

	ESKO	ESKO	ZUND	XYZ	XYZ
<b>Maximum RPM of Spindle</b>	40000 RPM	55000 RPM	46600 RPM	24000 RPM	24000 RPM
<b>Type of tool (4mm)</b>	BIT-MUS06-4006-50C1	BIT-MUS06-4006-50C1	R104 4 mm	90 Degree V-Groove	6mm End Mill
<b>Recommended Feed Rate</b>	83 mm/sec	200 mm/sec	200 mm/sec	350 mm/sec	320 mm/sec

*\*We always recommend that you allow time for your own individual testing as results may vary based on machine version.  
Please contact your router manufacturer for more information about optimal settings for your application.*

## Additional Settings:

Esko Kongsberg:

	1 kw Spindle		3 kw Spindle	
	XP	XN	XP	XN
<b>Velocity X/Y</b>	5 m/min	5 m/min	12 m/min	12 m/min
<b>Acceleration</b>	50%	80%	50%	80%
<b>Z-Axis Depth</b>	1 m/min	1 m/min	1 m/min	1 m/min
<b>Spindle RPM</b>	40000	40000	55000	55000

Zund:

Zund	
<b>XY Speed</b>	200 mm/sec
<b>Acceleration</b>	4 (100%)
<b>Spindle RPM</b>	46600
<b>Cutting Mode</b>	Standard
<b>Clearing Distance</b>	5.00 mm
<b>Multipass Max Depth</b>	4.00 mm
<b>Multipass Last Depth</b>	0.30 mm
<b>Base Depth</b>	0.20 mm
<b>Finishing Path</b>	5%

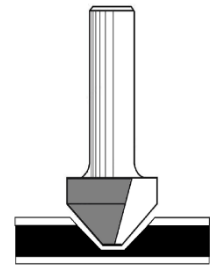
MAX-Metal

Element (Steel):

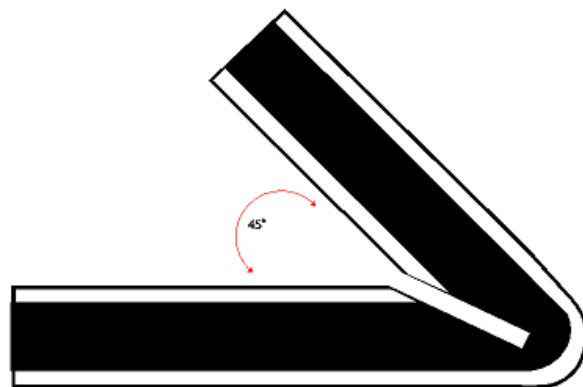
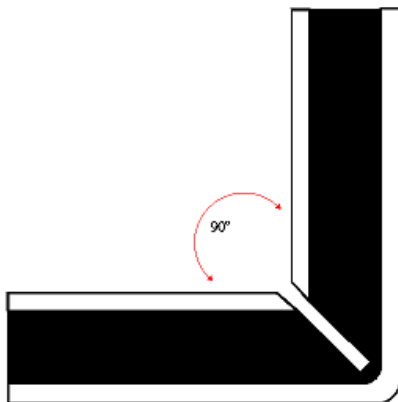
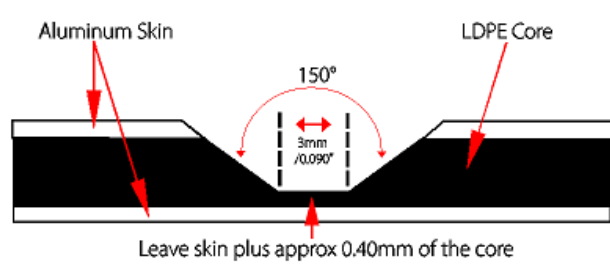
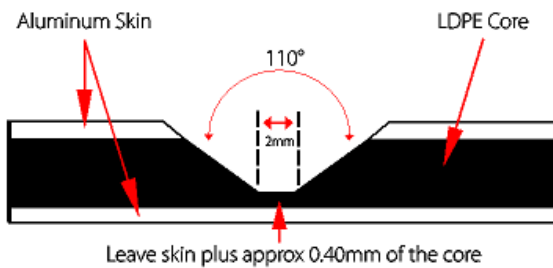
Standard CNC	
<b>Bit</b>	4mm
<b>Pass Depth</b>	10mm
<b>Stepover</b>	1.8mm
<b>Spindle Speed</b>	12000-24000 rpm
<b>Feed Rate</b>	35mm/sec
<b>Plunge Rate</b>	15mm/sec

**ESKO Settings:** The material cuts nicely between 300-500 in/min 55000 rpm with a 4mm coated bit in 1 pass. LubriCool will help with bit life. Recommended Bit: BIT-MUS06-4006-50C1

# V-GROOVE INSTRUCTIONS



MAX-Metal can be routed using conventional Routing machines. For accurate and precise manual bending of the MAX-Metal composite panels, resulting in a good finish, we recommend to route the rear of the panels to 2.5mm thick, going through the exterior aluminum layer and some of the Polyethylene core. Normally the panel is grooved and bent 25-70mm from the edge.



# || JOINING & MOUNTING INSTRUCTIONS

**Acceptable joining materials:** Aluminum, Plastic, Stainless Steel, Plated or Coated Steel with Cadmium, Zinc or Aluminum.

**Pop Rivets:** These are often used to attach aluminum clip angles and other structural or ornamental elements to MAX-Metal. When the rivet body will be in contact with the aluminum skin of the panel, it is recommended that either aluminum or stainless steel rivets be used to avoid dissimilar metals contacting. Ultimate shear and tensile strengths of various rivets are available from the rivet manufacturer.

*\*\* Please be advised that some building code jurisdictions do not endorse the use of pop rivets for structural connections.*

**Bolting:** Bolts provide an excellent way to join sheets of MAX-Metal together, or to other elements. Galvanized, stainless steel or aluminum bolts, nuts and washers should be used to avoid dissimilar metal contact. Caution is recommended in tightening the nut onto the bolt. The plastic core material is compressible, over tightening can deform the metal skins. Use lock nuts or double nuts with washers to prevent the nut from loosening over time.

*\*\*Testing is advisable to determine the performance of any fastening system.*

**Screws:** Screws are also used to perform many of the same applications as rivets. Stainless steel screws are industry standard and are appropriate to avoid corrosion and dissimilar metal contact. Screws are customarily installed through pre-drilled holes it is recommended that sheet metal screw thread type fasteners be used, especially when the screw is under tension load and this load is resisted by the aluminum skins. Occasionally, MAX-Metal is face-fastened directly to supports or sub-grids. The type and thickness of the support metal, as well as the applied load, will dictate the size and thread type of the correct fastener.

**Adhesive Bonding:** In addition to structural adhesives, double sided tape can be used for attaching MAX-Metal onto flat surfaces such as walls, ceilings, furniture, coverings etc. Extreme care should be given when selecting the adhesive to ensure it is chosen according to the application and the environmental conditions. It is important that the manufacturer is consulted for further instructions prior to the usage of the adhesive. The substrate surface should be clean before the application of the structural adhesive.





# || MAINTAINING VISUAL CONSISTENCY

**Visual consistency:** Each of our product types has special characteristics that can affect the visual consistency from batch to batch and even from panel to panel. It is important that these characteristics be considered when planning how to use and install MAX-Metal.

**Solid colors:** The industry standard for allowable variation for panel to panel and batch to batch is Delta E 1.0 or less in a hunter color space. Brighter colors, such as reds, yellows, blues, etc., which tend to be less opaque and which depend somewhat on film build (paint thickness) to achieve their appearance, will be more likely to exhibit more variation than subdued colors.

**Projects - same batch:**

Production Batches/Projects: When working on projects it is recommended that material from the same production batch is used in order to maintain overall visual consistency. For these reasons the panels must be installed with the directional arrows all aligned in the same direction. Batches should not be mixed on a building face without first contacting MAX-Metal for a confirmation that they are visually similar enough to be used together. Before fabrication, remember to use a felt tip pen to draw arrows to indicate the coating direction on any small pieces that might be cut out from areas without the directional arrows.