



## CO2 Laser Machined Parts Tips & “Rules Of Thumb”

Removal of edges of customer supplied material requires at least .100 inch border (waste area).

Tolerances for scribed and broken parts:

<u>Material Thickness</u>	<u>L x W Tolerance</u>
.010-.025 inches	+/- .002 inches
.025-.040 inches	+/- .003 inches
.040-.060 inches	+/- .004 inches

If using edges for critical pin alignment for printing, sawed edges or laser machined “flats” are recommended.

For “window frame” parts: Side wall thickness should be at least 2 times material thickness and outside of frames should be diamond sawed.

“Post cut” designs: allow .002 inches minimum space to metal feature.

Corner chamfer cuts inside saw alleys should be line cuts as opposed to triangular “drop outs”.

Electronic file formats:

AutoCAD .dwg is best  
.dxf is acceptable

Drawings: Include all pattern to cut feature dimensions and tolerances to avoid order delays.

If holes must be drilled to fit pins, specify pin gage measurement requirement. If physical device must fit into cutout, specify device maximum size. Caution: allow for .002 inch typical corner radii when designing cut- outs.

Hole tolerances: +/- .002 inches diameter capability single side. Taper must be taken into account for two side tolerances.

Kiln firing (anneal) standard cycle: Ramp fire over 24 hour cycle to 2000 degrees F or 1093° C peak.

Feature spacing in alumina to avoid cracking:

<u>Thickness</u>	<u>Feature Spacing</u>
≤ .015 inches	.010 inches
>.015 inches	50% of material thickness

Feature spacing in BEO to avoid cracking:

<u>Thickness</u>	<u>Feature Spacing</u>
≤.015 inches	.010 inches
>.015	100% of material thickness

If the part looks like it will fall apart from machining, it probably will.

Scribe depth recommendations:

Alumina

50% of material thickness, +/- .002 inches

Pulse spaces, .006 inches nominal

BEO

60% of material thickness, +/- .002 inches

Pulse spaces, .0065 inches nominal

When machining aluminum nitride, metallic aluminum forms on cut edge.

Feature centerline to centerline placement accuracy: +/- .001 inches typical.

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