

Freedom to

Working with metaMETAL

metaMETAL is a new kind of modeling material that makes it easy to create stainless steel and other steel alloy components.

Use metaMETAL to:

- eliminate much of the intensive work required to machine steels
- speed up machining and increase productivity
- use smaller diameter tools at higher feedrates with less breakage
- eliminate coolants
- create delicate features that are difficult to machine directly
- use light-duty equipment to machine stainless steel

Creating Parts

- milling or turning on conventional metalworking equipment
- machining on light duty CNC milling or turning machines
- cutting with common woodworking tools
- carving with hand tools
- trimming with a sharp knife

Typical cutting feedrates and spindle speeds will range between the recommended values for cutting wax and aluminum.

Scaling

Because metaMETAL shrinks during processing you must compensate for this by scaling your desired part dimensions by a scaling factor in all dimensions. For 316 stainless steel, this scaling factor is 1.16.

For example, if you wish to create a ring shaped part with a 20 mm outside diameter, a 15 mm diameter hole, and 10 mm tall, then scale all dimensions by a factor of 1.16. (This is a trivial operation for most CAD or toolpath generation programs.)

Desired dimensions		Machining dimensions
20 mm OD		23.2 mm OD
15 mm ID	x 1.16	17.4 mm ID
10 mm tall		11.6 mm tall

To check dimensions of your machined parts to make sure they're correct, simply divide by the scaling factor to determine the final dimension. For example, $17.4 \text{ mm} / 1.16 = 15 \text{ mm}$.

Although you can thread and tap the material, it's best to leave these operations until after processing when you can use standard taps and threading tools. Before processing you must scale all thread dimensions including thread diameter, thread depth, and pitch by the material's scaling factor (such as 1.16).

Safety

Although metaMETAL is non-toxic and does not produce significant respirable dust when machined, please take precautions similar to those recommended for machining other comparable plastic and metal materials.

For material safety data sheets, please check our web site or contact CAM-LEM at the address below.

The fully processed parts are essentially pure metal of the specified composition (such as 316L stainless steel), and can be treated just like conventional wrought materials.

Processing

Please check our web site at www.metametal.com to locate the nearest metaMETAL processing center, review the schedule of processing, determine pricing, specify return shipping options, and order special processing services.

Processing turnaround times will depend on order volume at the time you submit your parts for processing. Batches of standard materials will be processed at least once a week. If your parts arrive on a Tuesday and the next processing cycle is scheduled starting Wednesday, for example, your parts should ship out on Friday and arrive the following Monday if sent with overnight delivery.

Please list the plate numbers used to create each of the parts sent in for processing. Processing costs are based on the number of parts that will fit within a "footprint" and height of each plate. You may combine multiple parts from different blocks in a single processing order, but they must all fit within the space occupied by one equivalent block in order to qualify for processing as one group.

Recycling

Leftover material can be recycled, but only if kept clean and free of contamination. All metaMETAL blocks are currently made from original feedstock. However, you may ship clean, oil-free excess material to CAM-LEM for future recycling. We may offer a less expensive recycled block for less critical applications, or reprocessed material back to larger customers.

For further information, please contact CAM-LEM, Inc. at the address below.