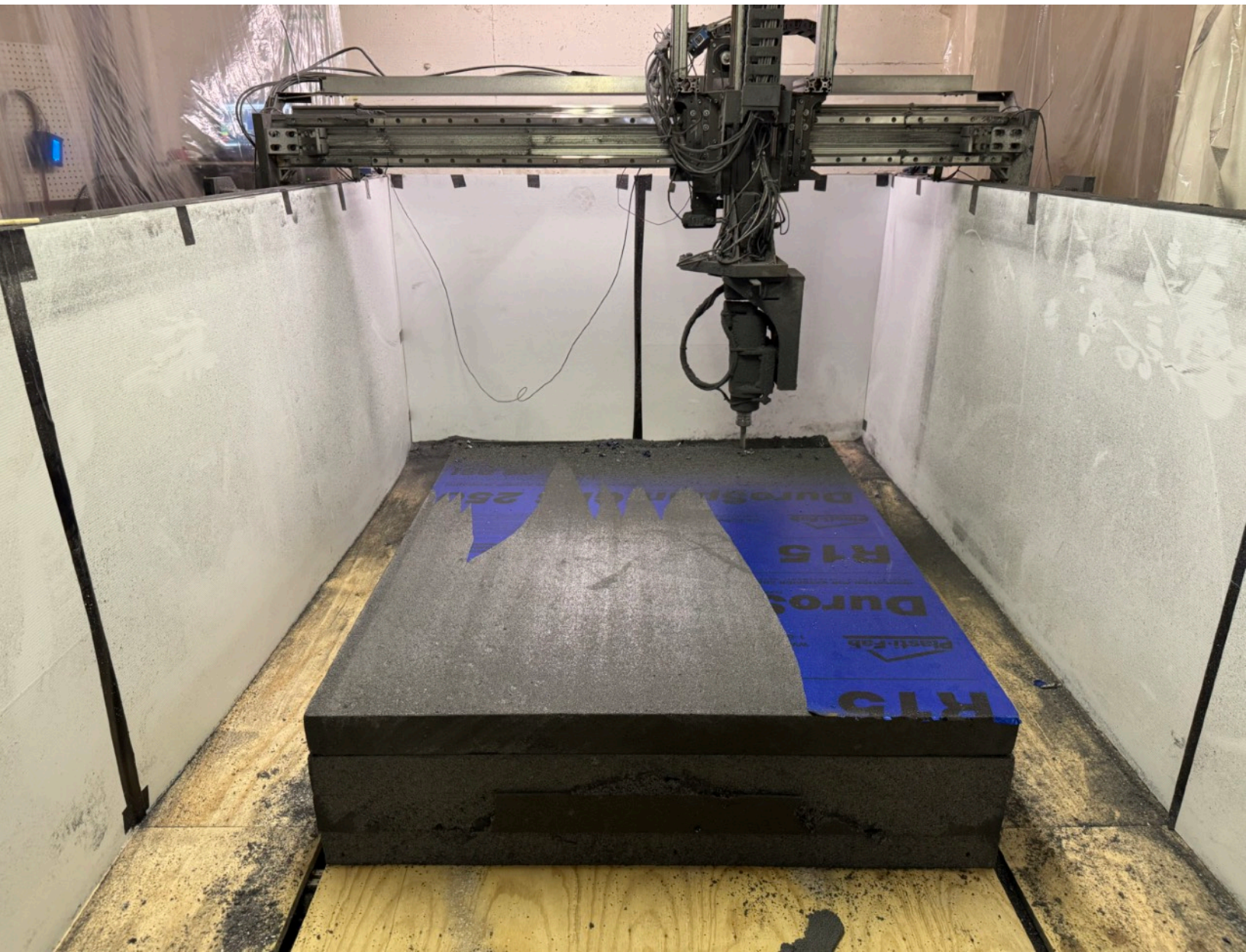
ARMA AUTOMOTIVE INC.
5-Axis CNC Router Services

Arma is offering builders precision CNC-cut foam moulds and formwork for automotive projects. Using medium-density, cost-effective 2 lb/ft³ foam, our CNC router delivers accurate, high-quality shapes ready for mould making. Services are billed based on materials plus machine time, with flexible finishing options—from raw cut foam to sanded and coated surfaces for a smooth, production-ready finish.

Reach out for a manufacturing slot today.



What Can Be Made With 5-Axis CNC Routing?

Arma's 5-axis CNC routing service opens the door to projects that would be impossible or prohibitively expensive to shape by hand. Automotive builders can take advantage of precision-cut foam moulds to produce custom body panels—fenders, hoods, wings, side skirts, diffusers, and other aerodynamic components. Whether it's restoring a classic, prototyping a one-off concept, or developing performance upgrades, our process delivers accuracy and repeatability.

Beyond cars, our machines are equally valuable in other industries. Designers and fabricators can create tooling, jigs, and composite moulds for production. Architects and artists can realize bold, sculptural forms for installations, facades, or exhibits. Marine and aerospace builders can generate lightweight moulds for hulls, fairings, or interior panels. Even furniture designers, product developers, and creative studios can benefit from the ability to shape large, complex forms quickly and consistently.

In short, if you can imagine it, we can cut it. From high-end automotive parts to large-scale art pieces, our 5-axis CNC routing provides a fast, reliable path from concept to physical form.

Pricing & Services

Arma's 5-axis CNC routing service is priced to provide clear value while ensuring every project is handled with care and precision. We've designed our pricing structure to be straightforward, so you know what to expect without endless estimating or hidden costs.

Machine Time – $100/hr CAD

Our core rate covers active cutting time on the 5-axis CNC router. If the spindle is running, the machine is producing your part with accuracy and speed.

Manual Services – $44/hr CAD

This covers all support work that makes your project possible: material purchasing and pickup, machine setup, sanding, refuse disposal, and careful packaging for shipment.

CAD/CAM Preparation – $75/hr CAD

Most projects require some digital preparation before cutting. Whether we're cleaning up a 3D file, generating tool-paths, or modelling forms from your concept, this ensures the router has precise instructions. Typical jobs require 2–8 hours depending on complexity.

Materials – Cost + Handling

We supply quality foam as the default cutting material, billed at cost plus a modest handling allowance. Alternative foams or coatings (such as epoxy sealing) can be substituted if your project requires additional strength or a smoother finish.

Minimum Job Fee – $250 CAD

To keep things efficient and fair, all projects are subject to a minimum charge. This covers CAD/CAM setup and at least one hour of machine time.

Finishing Options

The level of finish you choose depends on how you plan to use the foam forms.

Raw Machined Foam (Standard)
All projects are delivered as freshly cut foam. At this stage the surface has visible tool paths and edges but is dimensionally accurate. Many customers prefer this option because it's the fastest and most cost-effective, and they can perform any sanding or finishing themselves.

Rough Sanded + Epoxy Coat (Optional)
We can provide a lightly sanded surface sealed with a thin epoxy coat. This reduces dust, slightly hardens the surface, and provides a smoother starting point. It's ideal for parts that need a cleaner presentation or a semi-durable finish but are not yet ready for direct composite layup.

Mould-Ready (Premium)
For tooling or composite production, parts must be finished to a much higher standard. This involves hours of careful sanding and multiple epoxy coats to create a smooth, durable, hard surface. Depending on part size and geometry, this level of finishing can require several days of work per part.

Higher-Density Foam Options
Upgrading to higher-density foam reduces sanding time and produces a finer finish, though some level of post-processing is always required for moulds or composite layups.

Example Project

A medium-sized automotive hood buck might include:

- CAD/CAM setup: ~4 hours ($300)
- CNC cutting: ~15 hours ($1,500)
- Manual services: ~8 hours ($352)
- Foam material: ~$460

Estimated total: ~$2,600 CAD

We can begin work on a project provided available supplies and machine time after a estimated 50% deposit. A final payment is required before shipping.

Buck vs. Direct Mould

We can machine your project in two different ways, depending on how you intend to use it:

- Buck (Positive Form): A buck represents the exact shape of the final part. This is the standard method for creating moulds. The buck is finished smooth and hard, then used to make a high-quality negative mould in fibreglass, carbon fibre, or other composites. This process takes longer but produces professional results.
- Direct Mould (Negative Form): We can also cut the inverted shape directly as a mould. This is faster and allows immediate part production, but finishing the inside surface is far more difficult. For high-quality or visible parts, we recommend the buck method.

Timelines

Project timelines vary depending on size, complexity, and the level of finishing required. To help you plan, here is what you can typically expect:

Design & CAD/CAM Preparation:
Most projects require 2–8 hours of digital setup before machining. If customers supply clean 3D files, this stage is faster; if design cleanup or modelling is needed, additional time may be required.

Machining:
Once the tool-paths are ready, cutting can take anywhere from a few hours for small pieces to 2–3 days of machine time for larger bucks such as full panels or body sections.

Finishing:

- Raw Machined Foam: Delivered as soon as cutting is complete.
- Rough Sanded + Epoxy Coat: Adds 1–2 days depending on size and part count.
- Mould-Ready Finish: Requires several days to a week per part of detailed sanding and epoxy coating for a smooth, hardened surface.

Total Turnaround:
Small projects may be completed in under a week. Larger, mould-ready bucks or direct moulds may take 2–3 weeks from start to shipping, depending on workload and finishing requirements.

We aim to keep schedules transparent and predictable. Rush service may be available for time-sensitive projects.

Accuracy & Capabilities

Our 5-axis CNC router is designed for precision and flexibility. Projects that require complex geometry, smooth curves, or deep undercuts benefit from the additional reach and articulation compared to standard 3-axis machines.

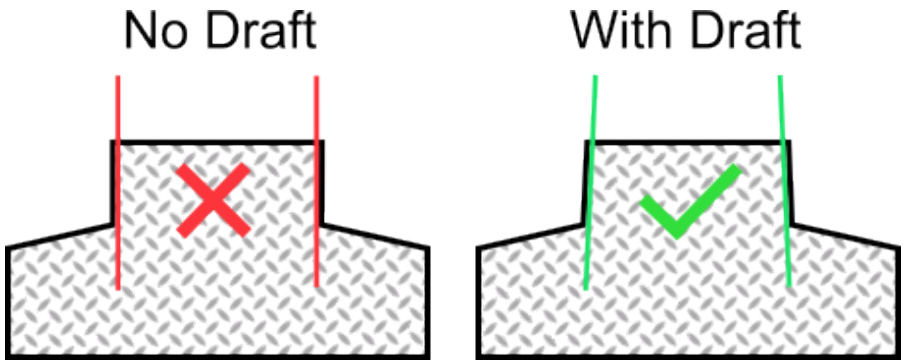
- Accuracy: Typical tolerances are within ±0.5 mm, more than sufficient for mould-making, composite tooling, and large-format prototypes. For smaller features or tighter requirements, accuracy can be further improved with specialized finishing passes.

- Scale: We can machine large forms by sectioning them into cuttable blocks and reassembling them with precision alignment. This makes it possible to produce everything from small components to full body panels.

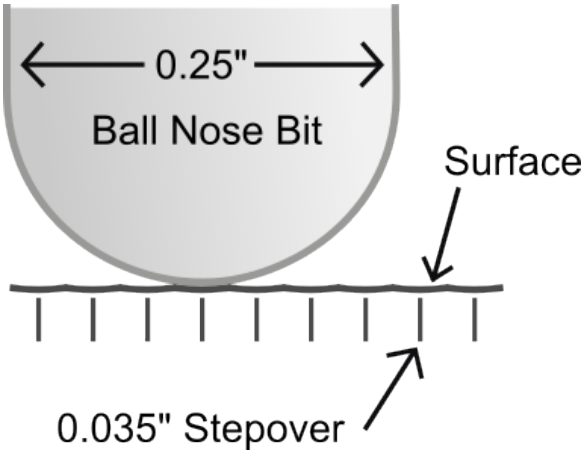
- Flexibility: From positive bucks to direct negative moulds, we can adapt our process to your project's needs. Foam densities can be selected based on desired surface quality and strength.

Our router capacity is 48" x 96" X 16". Any model design that is larger will need to be split into separate parts and assembled after cutting to form the desired part.

Moulds need to be designed with edges in a way that allows parts to be released freely where the angles on all surfaces are not parallel. Small areas can have no draft but generally this makes removing parts more difficult.

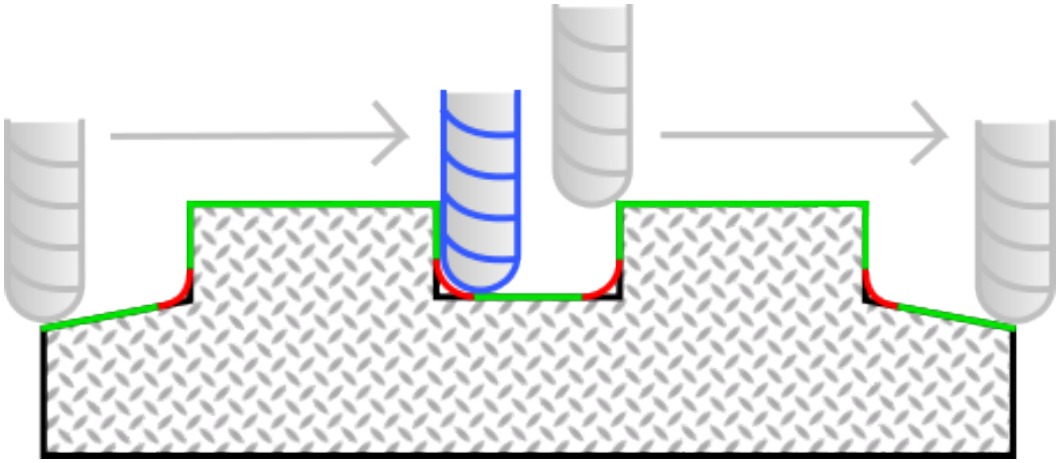


Our tool path software cuts parts in a full sheet bi-directional raster pattern which appears as a zig zag over the surface of the stock material. Our default step over (distance between each pass of the router bit) is 0.035" or 0.889mm with a 0.25" ball nose bit.



In most cases this creates a very accurate surface finish on the top face and some sanding is needed on vertical edges particularly on edges along the Y axis.

There is a tool reach limitation on ridges facing down because of our minimum radius 25" ball nose bit. This means that the cutter can't reach areas under the size of this radius. Outer edges facing up are reachable and will be cut with good accuracy.



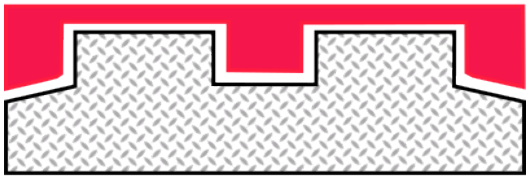
We use Arma Design Studio software to generate tool cutting paths that are optimized for large contoured surface projects.

Most part designs are cut from blocks in three stages, the first removes most of the unwanted material and leaves a thin layer of foam before the target surface.

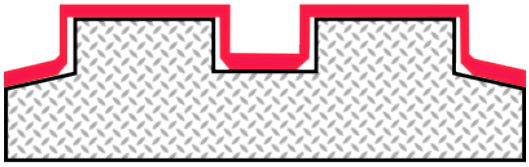
The second stage finishes the majority of surface using a 0.25" ball nose bit. The surfaces facing the router are finished mostly smooth. This stage takes most of the machining time.

The third stage cuts edges that are remaining from the finishing pass as best as it can. Sanding and finishing surfaces and sharp edges will still be required.

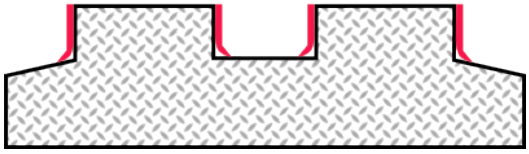
Step 1 - Roughing Pass
Removes Most Material



Step 2 - Surface Finishing
Cuts a Smooth Surface



Step 3 - Wall Edge
Cleans Edge Surfaces



Arma Design Studio is our commercial CAD/CAM software that is available at https://armaautomotive.com/build/. It runs on Windows, Apple Mac OSX and Linux.

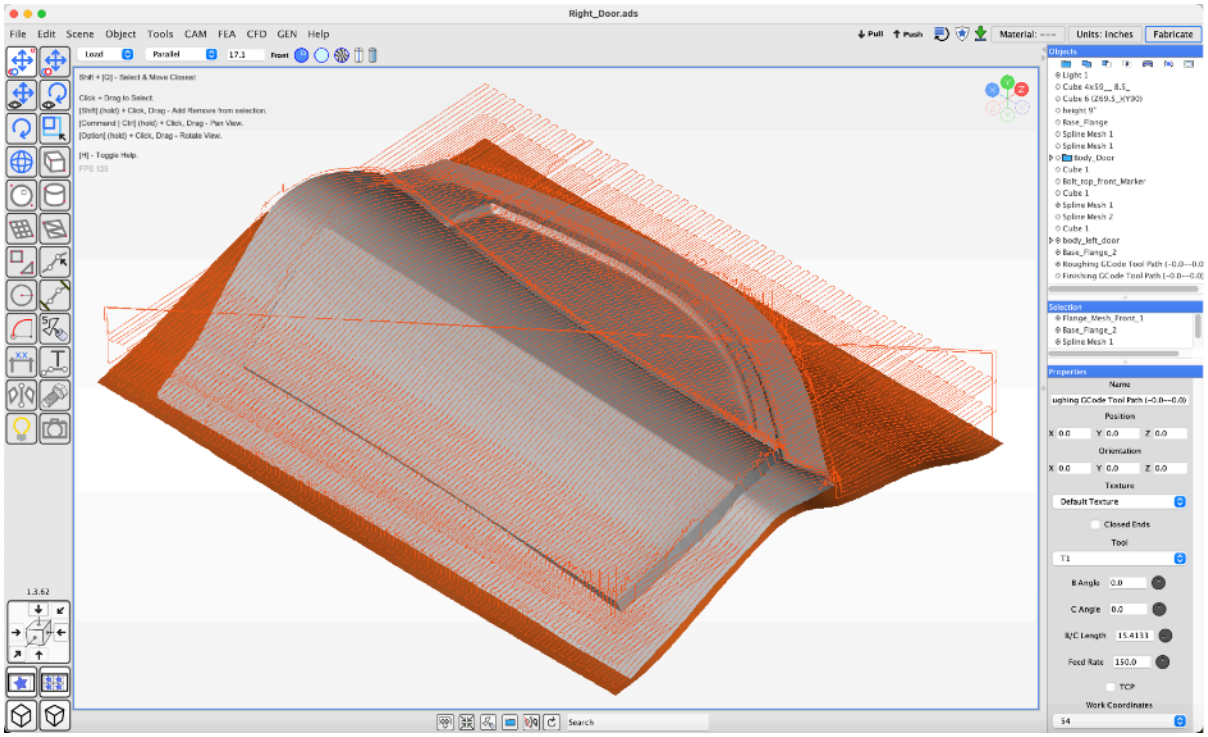


Illustration: ADS generating a roughing pass on a sample part.

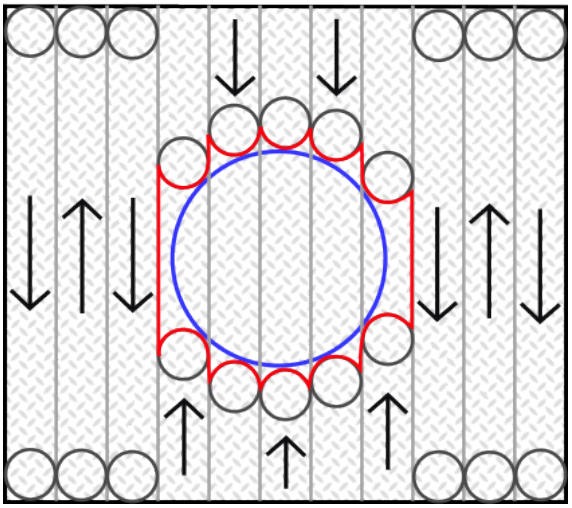
Our default tool pathing is designed for large continuous surface parts that can be sanded and long continuous edges that can have defects filled and corrected after cutting.

Small fine detail will not have reliable accuracy as illustrated below our finishing pass uses a criss cross raster pattern that leaves the red shape from the target blue circle.

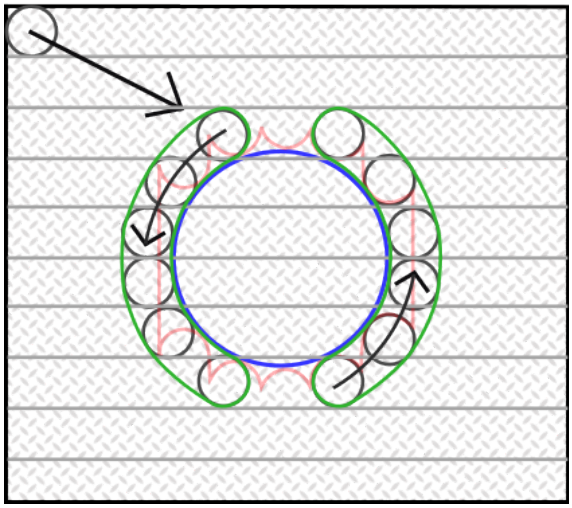
Our edge cutting pass is currently not reliable on curved features. It will do its best to put distinct edge features but customers should be prepared to finish fine detail by hand.

If high detail accuracy is required we recommend a higher density foam to ensure the small features are more sturdy and an engineers assistance developing a custom tool path using other software such as Fusion 360.

Finishing Pass



Edge Pass



Illustrations: Finishing pass leaves artifacts reflected in the red line. If the edge pass detects an edge it will attempt to cut edges in green.

Materials & Options

The choice of material has a major impact on cost, surface quality, and the amount of finishing work required. We primarily machine foam blocks, which offer an excellent balance of affordability, machinability, and size flexibility.

- Standard Foam (2 lb density):

Our default material is medium-density foam, ideal for most bucks, prototypes, and general shaping work. It machines cleanly and is cost-effective, making it the best choice for large projects where budget is important.

- Higher-Density Foams:

For projects requiring a smoother surface or less sanding, we offer higher-density foams. These reduce finishing effort but come at a higher material cost. They are well-suited for moulds or parts where surface detail matters.

- Coatings & Surface Treatments:

Foam can be sealed and hardened with epoxy or other coatings to improve durability and finish quality. This is especially important for moulds that will see repeated use in composite layups.

- Special Requests:

While foam is our primary material, alternative options may be available depending on project requirements. For example, higher-strength or specialty boards may be used for tooling or display applications.

By tailoring the material to your project, we ensure the right balance between cost, finish, and performance.

Finishing Services

We offer several levels of finishing tailored to the needs of each project. Foam components can be delivered in the following states:

- Raw Machined Foam – Directly off the router with visible tool paths. Best for customers who wish to perform their own finishing or use the piece strictly as a plug or buck.

- Sanded – Light sanding to smooth rough tool marks and provide a more uniform surface. Suitable for basic shape verification, mock-ups, or display models that do not require surface coatings.

- Epoxy-Sealed – Sanded surfaces with a coat of epoxy applied to harden and stabilize the foam. This reduces porosity, improves durability, and creates a more robust base for additional finishing or for use in moderate-duty moulds.

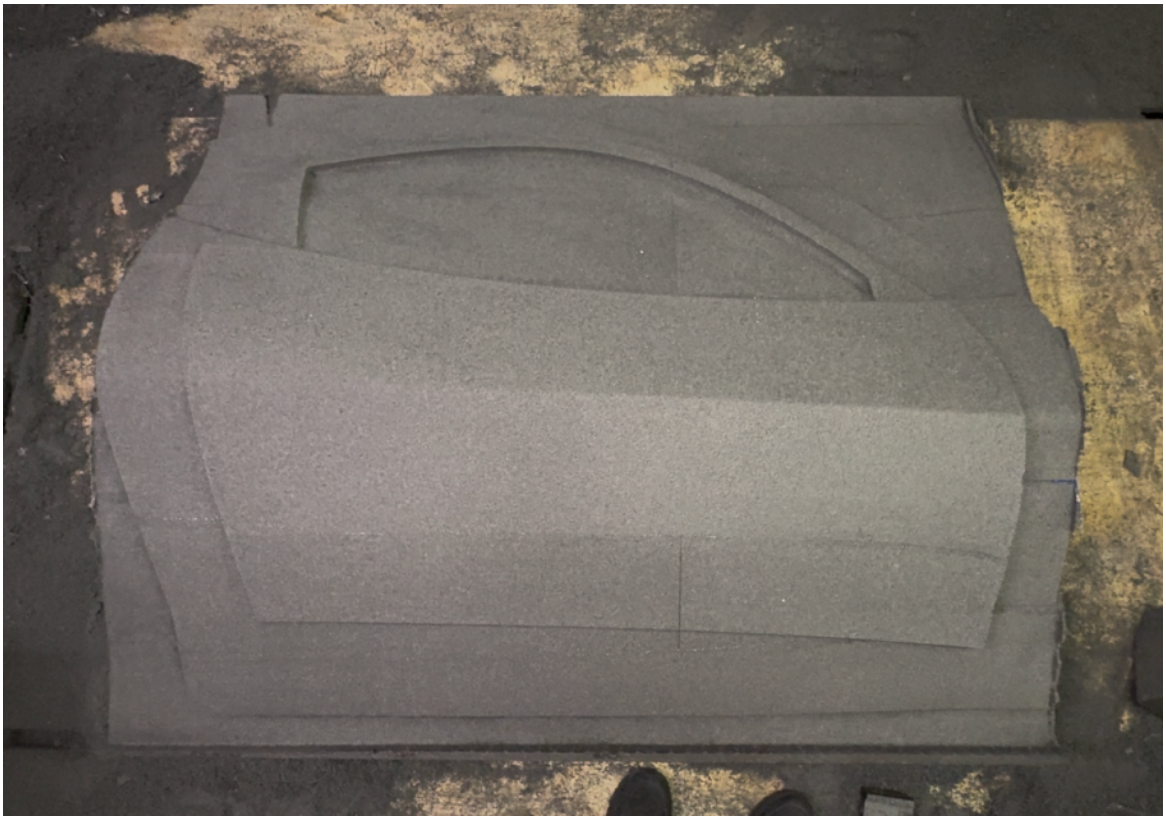
- Fully Smoothed (Mould-Ready) – Precision sanding, epoxy sealing, and additional smoothing steps to achieve a hard, consistent finish. This level is designed to minimize further surface prep and is recommended for customers making composite moulds or production-quality parts.

Recommended Uses

- Composite Production: For layups and high-quality parts, we strongly recommend epoxy-sealed or fully smoothed finishes. These provide the hard, non-porous surfaces necessary to achieve accurate moulds and durable tooling.

- Display Models / Concept Forms: Sanded finishes are often sufficient for visual presentations, scale models, or design mock-ups. Raw machined foam may also be acceptable if the project only requires general shape verification without a focus on surface quality.

Raw unfinished forms will have ruff edges and faces that require sanding and finishing. A ruff cut part is the lowest cost option however we recommend that the parts are lightly sanded with an epoxy coat to help protect the part from damage if it is being shipped.



Light sanding and epoxy coating is an additional option we offer that requires a few hours of labour but adds to the durability of parts during shipping. Note that these parts require more fill and sanding before they can be used to make moulds or parts.

One layer of epoxy increases the hardness and durability of the surface detail.

Finished forms take approximately one week as there are many coats and sanding each requiring a twenty four hour curing period. Finished parts are ready for mould making. If you have any questions about working with composite we recommend that you reach out to us.

Additionally higher density foam / tooling board can be used but this requires significantly higher material cost as well as more router time for each part. Our machines, software and experience levels are targeted towards the 2lbs eps foam which relies on sanding and epoxy coatings for durability and finish quality.

Shipping & Logistics

Parts are cut from foam blocks that are up to 48”X96”X16” in size. Multiple parts can be packed into one block or if the part set does not require a full block it will be cut down to a smaller rectangular size for shipping.

Each block will be encased in EPS foam on the sides and top using epoxy for protection during shipment. The encasing foam will need to be removed upon delivery.

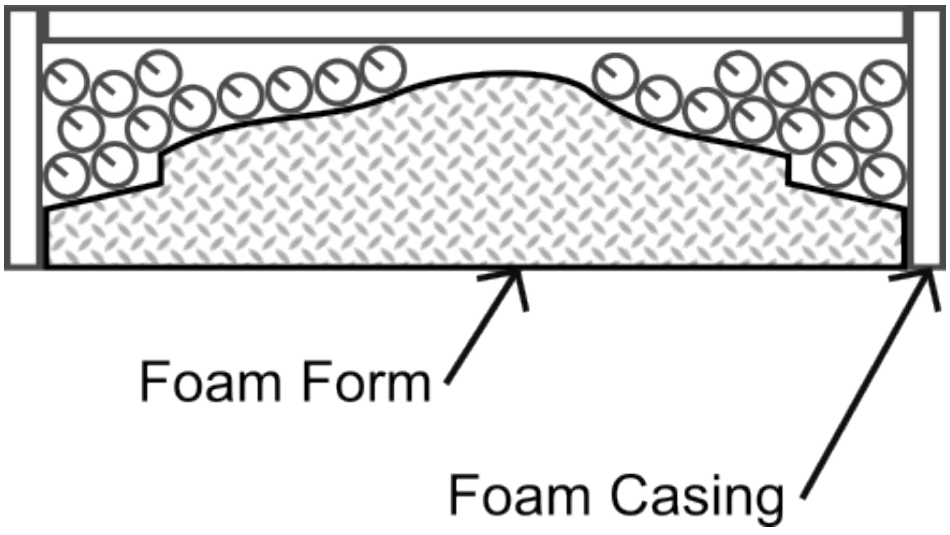
A plastic wrap around the package will be added along with packing foam.

Each block can be shipped individually as they are manufactured.

The foam blocks are weather safe and will not be damaged by exposure to water or sun. The foam blocks are however considered fragile and care should be taken to avoid dropping or crushing. The blocks should not have other objects stacked on top of them.

Customers can optionally arrange to pick up blocks at our Victoria B.C. Canada location.

Shipping charges are calculated at the time of delivery.



8. Warranty & Support

Parts manufactured are guaranteed to provide a level of dimensional accuracy where major surfaces are within 0.75mm, edge surfaces within 1mm with raw machining parts containing cusp marks or scallops that are intended to be removed manually may be larger than 1mm in areas.

Some edges may need work by sanding or filling after delivery. These products are intended to be a foundation for developing moulds which require additional sanding and filling on areas where the tools are not able to correctly cover.

In rare cases a tool path may accidentally make an incorrect cut by a few millimetres which may need to be filled.

We can provide photos of the finished parts prior to shipping for acceptance or rejection. If a part is not accepted, we can refund any applicable deposit.