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Gearing Up to Manufacture in Connecticut

Nearly 5,000 manufacturers make up Connecticut's manufacturing base, which is among the most productive and capable in the world.

Connecticut manufacturers serve a wide range of markets and have broad capabilities in: machining, forming, casting, extrusion, injection molding and additive manufacturing. There are also companies that provide supporting services such as soldering, brazing, welding, coating, heat treating, plating and anodizing. Still others produce fabricated assemblies and a variety of products for businesses and consumers. There are also manufacturers producing a range of chemicals and pharmaceuticals.

The largest segment of Connecticut manufacturers, about three-quarters, consists of contract manufacturers. They make things in response to requests from customers, but typically they do not have design capabilities. Therefore they must be provided with a sketch or blueprint that indicates what is to be made and what materials are to be used. Moreover, most make only components, as opposed to subassemblies or finished products.

Prototyping

First-Stage Prototype

If you are an early-stage company in Connecticut that has developed a product you would like to manufacture, how can you access help here in Connecticut, and where do you start? Your initial step is to build a first-stage prototype that demonstrates proof of principle – that your idea is functional.

This prototype could be made of wood or paper and carved out with a hunting knife; it does not matter. It is intended to prove the principle, and it may not be fully functional. It might be machined by a conventional machine shop, or it might be manufactured by companies that do 3D printing in plastic or metal.

There are companies in Connecticut that specialize in prototype manufacturing – with diverse capabilities, including 3D printing. The manufacturing resources listed later in this article are a good place to start to find the manufacturers you need.

Second-Stage Prototype

After you have demonstrated proof of principle with your first-stage prototype, you will be ready to manufacture a second-stage prototype. For this prototype, choose a method that can produce at least small quantities of product suitable to introduce to the market, even if only for an assessment of market reaction. This manufacturing method does not need to be the optimum method to use later for large-volume

production; at this stage, your aim is to introduce product to the market for evaluation and demonstrate that the product can be made by commercial practices. An important benefit of the second-stage prototype is that it will provide you with insights on the cost-versus-sales-price relationship, which you can determine if you know the distribution path to the market and can calculate the markups by distributors, wholesalers and others.

Before approaching a manufacturer for your second-stage prototype, it is essential to answer these three questions:

1. *What do I really know about the market?* Do I understand where it is, how big it is, how I access it, and where my product will fit in terms of price and value relative to the rest of the competition? While you are exploring this question, you will also need to learn something about the market's infrastructure – how to access customers, what the regulatory issues are, what the quality standards are, and so on.
2. *What protection do I have, and need, to put samples in the field, or even discuss seriously with a manufacturer what I want?*
3. *What portions of the business do I want to control tightly?* Think about whether you wish to eventually manufacture this product in-house or outsource the manufacturing, and whether you will focus

on product innovation and development, sales and marketing, distribution, or some combination thereof.

The answers will impact which manufacturer you choose at this stage and determine whether the second-stage prototype will be used for marketing assessment only or will also represent how you will produce small volumes of your product.

If, as is usually the case, you need engineering and design help before approaching a manufacturer, you may wish to work with a component maker with design capability or go to a design house that can connect you with a manufacturer.

Further, if you are willing and able to serve as a general contractor, you can utilize multiple manufacturers (e.g., you might use one that produces components, another that provides intermediary services like heat treatment or finishing, and another that assembles the components into a product, inspects, packages and ships). If you do not wish to be a general contractor but would still like to engage multiple manufacturers, the company you select to do assembly may be willing to, in essence, serve in that role and help find the manufacturers you need.

No matter how many manufacturers you ultimately work with, development of your second-stage prototype is likely to be an iterative process requiring some trial and error before you arrive at a functional,

aesthetic and economically viable product. This process will offer a good guide for tooling costs and for unit pricing over some volume range, but it may not represent the costs for tooling optimized for higher volume production.

How do you decide what path is best and access the capabilities you need? To access local talent, the following resources should be helpful.

- [New Haven Manufacturers Association](#) (NHMA)
- [Aerospace Components Manufacturers](#) (ACM)
- [Smaller Manufacturers Association](#) (SMA)

The websites of these associations share directories that provide members' contact information and a brief description of the services they provide. ACM members are essentially all manufacturers. The other two associations also have a significant number of members that provide services to manufacturers, like marketing, financial help and so on.

- [CONNSTEP](#): CONNSTEP is a consulting group that assists manufacturers in Connecticut and has a network of local manufacturing resources. As an affiliate of the National Institute of Science and Technology (NIST), it also has ties to a 50-state manufacturing network. One member of this network, in Cleveland, focuses on providing support for small companies developing new

products. That member can work with Connecticut startups through CONNSTEP.

You may access any of the above resources through CONNSTEP by calling Frank Rio or Jack Crane at (860) 513-3201. Be prepared to clearly convey your needs and provide evidence that you understand the market you are targeting and have access to funds to pay for the services you are requesting.

Finally, at this stage you should have secured sufficient intellectual property protection for your product or technology – enough to protect your second-stage prototype in the field and when you are discussing it with prototype manufacturers.

Third-Stage Prototype

After you have evaluated the performance of the second-stage prototype in the market and decided you want to proceed, the next step is to prepare the pre-production, or third-stage, prototype. The third-stage prototype is the production model and will help you establish production costs at various volumes.

If you plan to use a domestic manufacturer, you will either continue with the manufacturer that made your second-stage prototype or find another that is more capable of manufacturing in the volumes you are

now considering. If you plan to use a manufacturer in a low-cost country, make certain you have assessed the issues associated with offshore sourcing. Offshore manufacturers often rely on large-volume production and make deliveries only when they can ship large quantities, in order to minimize freight costs. The outcome is that deliveries from such manufacturers may be infrequent. Additionally, product modification may be a nightmare. NIST has published a good assessment tool to determine realistic cost comparisons for products made abroad in low-cost countries versus those made in the United States. You can access this reference through CONNSTEP.

Meeting with Manufacturers

The best approach to take when meeting with manufacturers to discuss prototyping, larger-scale production, cost estimates or possible collaboration is candor. Express your needs and expectations clearly, provide as much detail about the product as possible and offer market projections based on professional market research. Also, be clear about how you expect to pay for the services you need.

Keep in mind that despite the apparent sluggish economy and the desire of contract manufacturers to make new products, most small manufacturers are wary of startups. They do not want to waste their time working with startups that have a poor understanding of their

markets and anticipated production volumes. They will expect you to have market research to support your claims.

About the Author



[Jack Crane](#) is director of growth and innovation services at [CONNSTEP](#). He provides manufacturers with guidance and mentoring in strategic planning, marketing, strategy deployment, lean manufacturing, product development and materials troubleshooting.

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