

# Equipment Roadmap

For Bactolac Pharmaceutical, planning ahead for fast growth means strategic equipment purchasing.

BY DONALD CONDIT

Since the day contract manufacturer Bactolac Pharmaceutical opened for business in 1996, the company has run on a fast track. Double-digit annual growth has propelled Bactolac from three employees to more than 400. Its manufacturing facilities—which doubled in size just three years ago—expanded again in 2012 to occupy a total 150,000 sq ft dedicated to production, biological and analytical laboratories, and storage for thousands of ingredients.

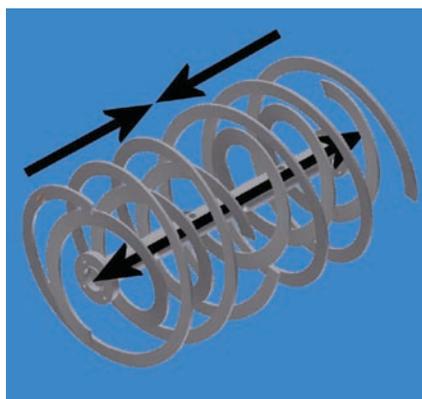
From its headquarters in Hauppauge, NY, Bactolac now ships thousands of varieties of multivitamins, sports and nutritional supplements, and meal-replacement products to markets worldwide. But according to founder Pailla M. Reddy, PhD, the company's formula for success is the same today as it was when the company was just a startup.

"We focus relentlessly on the fundamentals," says Reddy. "Our scientific expertise is very strong, with a high percentage of PhDs on our staff. We also invest heavily in technology, and our entire plant is GMP certified. That foundation in science, technology, and production gives us the strength to deliver reliably to customers.

"Meanwhile, we also have a clear vision of the road ahead. Our management team is constantly looking forward, adjusting our business model and anticipating our customers' future needs and the tools that will be necessary to meet them."

### Equipping for Growth

Bactolac has successfully scaled its production capacity to accommodate rapid growth.



In a modern sanitary ribbon blender (right), inner and outer helical ribbons turn on a common shaft in a U-shaped horizontal trough (illustrated at left). The ribbons are pitched to move material axially, in opposing directions, and also radially. Tip speeds of approximately 300 ft/min are typical, but with variable speed control this can be fine-tuned to optimize the blending action for a wide variety of ingredients. Close tolerances, flush valves, and a sanitary polish ensure fast discharge and efficient cleaning.

In tandem with a series of plant expansions, the company has repeatedly met growing demand with additional equipment on the plant floor. "Managing growth means staying ahead of demand, not just keeping up with it—scaling up strategically, not just scaling up," says Reddy.

He continues, "Scale-up can be a challenge in any production environment, but it's especially tough for a contract manufacturer. In most companies, 'scaling up' simply means producing more of what you're already making. In our business, we're aiming for increases in both capacity and production versatility. We have to anticipate production requirements for products our customers haven't even imagined yet."



Rapid and accurate blending is a critical process at Bactolac. The company's current lineup of sanitary ribbon blenders reflects its game plan for growth in capacity and competitive strength. (See Table 1.) Together, this array of blenders handles single-batch production requirements, from 1.5 to 385 cu ft. The company's latest addition is a very large, 385-cu-ft sanitary Ross Ribbon Blender, which increases the company's maximum single-batch production capacity by more than 200%.

"As we've grown, we've added blenders of increasing capacity," said Reddy. "Of course, higher-capacity blending enables us to reduce our long-run production costs significantly, and pass along the savings to our customers. That's a competitive advantage."

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Ken Langhorn, technical director at Charles Ross & Son Co. (Hauppauge, NY), further explained the benefits of having the right blender sizes to choose from. “To operate properly, all ribbon blenders require a batch volume of approximately one-third of their maximum rated capacity. This provides enough material to fully contact both the inner and outer helical ribbons in the blender.” (See photo on page 44.)

“Production runs that fall short of a blender’s minimum capacity require an unnecessary volume of ingredients to ensure proper blending,” he continued. “With blenders on hand in a variety of sizes, a manufacturer can assign each production run to an appropriately sized blender and reduce or eliminate waste.”

## Matching Blending Capacity to the Demand Curve

Bactolac’s 385-cu-ft blender reflects the management team’s forecast for an increase in high-volume orders. The ability to handle large orders in a single blender saves time, minimizes QA/QC sampling, and reduces cost.

Meanwhile, the overlapping capacities of the new blender, and two others in the plant, reflect the prevalence of mid-sized orders today. (See Table 1.) Orders between 36 and 80 cu ft—a broad range that includes the bulk of Bactolac’s production runs today—can be blended in either the company’s 80-cu-ft blender or its 120-cu-ft blender. Similarly, orders between 115.5 and 120 cu ft can be as-



**This 385-cu-ft sanitary ribbon blender currently processes green food powders, along with chocolate and red berry powders, in long production runs. Downstream from the blender, Bactolac ships these products in a wide variety of packages, from 30-gal drums to jars, bottles, and pouches.**

signed to either the 120-cu-ft blender or the new 385-cu-ft blender.

“For orders between 36 and 120 cu ft, we now have equipment options that allow us to be nimble, operate efficiently, and accelerate delivery to our customers,” says Reddy.

“Speed is critically important,” he adds. “That’s one of the key advantages of having analytical and microbiological labs onsite, for example. Of course, we could assess the quality of incoming ingredients and end-products using an outside laboratory. But that would slow down production.

“Customers in highly competitive businesses rely on us for the green food powders, sports and dietary supplements, vitamins, and meal-replacement products they need to go to market. In their world, every hour of delay is a lost opportunity. So, in our world, we take every opportunity to speed up production and ensure consistent quality.”

## Looking Ahead

“To be sure your process equipment is appropriate to meet your production needs of tomorrow, you need to create an intelligent road map today,” Reddy advises.

“Demand for natural remedies and life-enhancing products like green food powders is increasing worldwide,” he continues. “Our industry is expanding. In this environment, many companies like ours can grow quickly. But the most successful will be those with a forward-looking plan for expansion.”

Following Bactolac’s example, the following are some good fundamentals to keep in mind:

1. Invest in equipment capable of handling bulk densities somewhat higher than your current production requires in order to accommodate future product development. Also, stick with a single equipment manufacturer, if possible, which will help to streamline purchasing and support, and make ongoing equipment costs more predictable.

2. Choose equipment sizes that provide both a broad range of capabilities and overlapping capacities that translate into production flexibility.

3. Buy “forward.” Think ahead of your market. “Smart managers avoid the trap of presuming that as their business grows, it will always be business as usual—only bigger,” says Reddy. “At Bactolac, we are wired for growth and we welcome change. We’re ready for whatever our customers imagine next.”

**Table 1: Bactolac’s Ribbon Blender Capacity**

Blender	Maximum Batch Capacity	30% Minimum Batch Capacity* (cu ft)	Production Capacity Overlap for Enhanced Versatility
R&D, Development, Short-Run Production	5	1.5	
Production: Short Run	10	3.0	
Production	80	24.0	36.0 to 80.0
Production	120	36.0	cu ft
Production: Long Run	385	115.5	115.5 to 120.0 cu ft

\* Minimum blender capacity may vary from 25 to 40%, depending on batch materials and the volume needed to achieve axial and bi-directional horizontal blending.

Bactolac has equipped its plant with five robust sanitary ribbon blenders manufactured by Charles Ross & Son Co. All are constructed with Type 316 stainless steel, polished to a 150-grit sanitary finish, and able to handle bulk densities up to 64 lb per cu ft—nearly twice the industry standard. Blender sizes were selected to provide efficiency in both low- and high-volume blending, and to optimize flexibility in production.

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