

SUCCESSSTORIES

FROM THE CECO ENVIRONMENTAL FAMILY OF COMPANIES

Kirk & Blum turns warehouse space into cGMP-compliant processing labs for Cardinal Health in less than four months.

Four labs added to GMP corridor without interruption to manufacturing operations.



Winchester KY, February 1, 2007 – “It takes one to know one” is a well-worn come-back, but engineers at Cardinal Health’s Winchester, KY, plant might say it’s a useful rule to apply when choosing a building contractor for a “hot” project. As engineers for an award-winning contract pharmaceutical plant whose work is audited by major drug companies, the FDA and DEA, they have become good judges of other contractors. So when the plant needed a general contractor to build new processing labs and install a 60-inch tablet coater inside a functioning plant – and do it on a short schedule to meet a customer’s product launch – the project went not to a general contractor, but to the Lexington office of Kirk & Blum, a sheet metal and mechanical contractor that had earned its stripes on smaller jobs at the site over several years. The result was a shortening of a projected six-month build time to just under four months, complete with cost-reduction engineering and tricky installations of air handling and dust collecting systems.



Cardinal’s Winchester plant produces oral solid-dose medications, with a specialization in controlled-release and taste masking technologies. The plant serves customers worldwide, producing prescription and some over-the-counter drugs. “We are the manufacturing arm of major drug companies,” explains Tom Shultzaberger, Director of Engineering and Maintenance at the plant. “We must conform to customer manufacturing specifications, as well as the cGMP (Current Good Manufacturing Practice) defined by the FDA and European regulators. We also have to be quick and competitive. Time-to-market is everything for our customers. After years of product development and testing, they want drugs in the market as soon as possible after regulatory approvals. And with the stiff competition in our industry, we work hard to make our plant the best choice for our customers to manufacture their products.”

K&B brings ideas for time and cost reduction

A customer’s need for quick launch of a product meant additional processing labs in Winchester had to be ready to go by a specific date. “The start date for the project kept moving back as contract negotiation proceeded, but the start-up date for production was fixed,” says Shultzaberger. “We received approval for the project just four months before start-up, but assured our management that we could meet the deadline without interruption to current operations, though we still needed to do some value engineering to bring it in on budget. Our first choice was to act as our own general contractor, but our engineering staff had a full schedule at the time. Kirk & Blum was the primary sheet metal subcontractor on the job, and had demonstrated in years of past performance that they had the competence to be a general contractor on a project of this size, so to meet the launch date, we delegated the job to K&B.”



An A/E firm designed the new facility, but with the tight deadline, “we needed a contractor who could field-engineer on the fly to overcome issues that are inherent in a job like this,” explains Terry Wyatt, Manager of Maintenance and Engineering at the plant. “K&B had also demonstrated skills in value engineering a job to take out cost and time. Their project managers offered cost-cutting ideas the engineering firm hadn’t thought of, which helped us meet our budget.”

The 100,000-square-foot Winchester plant’s only option for adding processing labs was to take some space inside the existing warehouse area where the lab rooms could be “grafted” onto the concrete-block wall separating the warehouse and GMP corridor. The basic plan called for four 20’ x 20’ processing labs with 12’ ceilings and 2’ crawl space above for ductwork and HEPA filtration. Above the lab ceiling is a concrete-over-steel mezzanine floor that holds a 4000-cfm air handling unit for the pan coater installed in one of the labs. The overall area developed, however, is about 120’ x 20’ x 30’ (LWH). “We designed for additional labs in the future, and the steel structure and all the utilities are sized appropriately with duct and piping stubbed off, but in place and ready to build out,” Wyatt adds.

Fast, clean construction in a working pharmaceutical plant

To provide a contained work environment, K&B first cocooned the entire work area with plastic, then put it under negative air pressure with monitoring to ensure contaminants could not escape into the warehouse or processing areas. In addition, when GMP corridor wall had to be penetrated for new doors, it, too, had to be fully isolated from construction dust. “Keep in mind, we did this inside a functioning pharmaceutical plant and warehouse,” explains Wyatt. “Good Manufacturing Practices govern our warehouse operation, too, so dust had to be tightly controlled to protect our people, equipment, and material storage. We also have to control the construction workers and what they bring on our site. Personnel control, because of FDA/DEA registration, must be secure and well-coordinated. Control of contractors on our site is our biggest issue, because it’s almost always a contractor that causes a problem for us. K&B’s experience with this regimen was helpful on the job site, as well as in enabling them to make an informed project bid.”

The scope of work involved structural steel and sheet metal fabrication, concrete removal for installation of footers and drain lines, process piping, process electrical, fire suppression, explosion detection, dry wall, concrete pumping and finishing, painting, and installation of the pan coater. By using steel studding and epoxy-coated, waterproof dry wall, instead of 12”-thick concrete block walls, usable floor space is maximized, as is access to electrical, piping and ductwork for future modifications.

Making it all fit

In the course of the project, three air handling units were installed, two on the roof and one on the new indoor mezzanine over the pan coater room. The mezzanine air handling unit weighed 15,600 pounds and was installed in two sections on the mezzanine by clever rigging with just 27” of height clearance. A new dust collector for the pan coater also had to be brought indoors in four sections, down a tight hallway, and shoehorned into a “parking space” between other collectors with just 3/4” of clearance at some points.

“These are the kind of field problems that stymie most contractors and can’t be engineered from an office,” says Wyatt. “In one instance, K&B quickly adapted a change we needed in a wall to prevent it from covering up an important floor drain that had been misplaced by the design engineers. In recent years, K&B has helped us keep our dust collectors indoors for convenience of service by converting a number of bag-type collectors to cartridges. This helped us in two ways. We can get more collectors in a tight space, yet still have room for side-access service. The washable cartridges also increased the air flow capacity of the collectors, which allows us to increase our process throughput, yet keep solvent fumes diluted well below the LEL. On an earlier project in this same area, K&B field-designed a trombone-shaped section of duct work to fit a small space, giving us the duct length needed to properly space explosion sensors and dampers. They can look at these tight spots, take measurements, come up with a solution that fits the space, and then give me an engineering drawing in the end.”

“Careful staging of the work with trusted subcontractors, plus off-site prefabrication of as much steel and sheet metal as possible, minimized our impact on the site and helped us complete the job without overtime,” said Jim Carr K&B’s project manager. “It’s a matter of looking down the road for the potholes and working with the subs and owner to keep things on track.”

Without this kind of attention, Wyatt says, almost no amount of oversight or complaints from Cardinal would have helped much. “There was almost no margin for error on this project, and they stayed well within it. We originally hoped to get just the one lab with the new pan coater in operation by deadline, but we completed all of them on time and budget, including a multipurpose room we had not even planned to finish out.”

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