Sticking to the Plan

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 In the beginning, there were no single-use packaging applications. There were no dosage control offerings. There were no topical patches. There certainly were no transdermal delivery products. There was however, a stamping and printing company, as well as a man with vision, discipline and an open mind.

When Robert C. Klas, Sr. bought Tapemark in 1952, it was the step-child of a larger company that specialized in printing on self-wound tape to create labels. The business would prosper and work in a number of markets where pressure-sensitive adhesives and labels were needed. With applications ranging from automotive pin-striping to stickers for toys, Tapemark prospered and grew in West Saint Paul, Minnesota.

By 1978 the company had built a reputation for handling difficult materials for demanding applications — including medical devices. This included plastic sheeting for pain suppression devices, as well as electrodes that were affixed to the skin for electrocardiograms. More custom medical/pharmaceutical solutions followed and by 1986 the company was registered as a device contract manufacturer with the FDA.

Clean room manufacturing would follow in 1992, custom coating in 1997 and registration as a DEA Schedule III-V manufacturer of controlled substances was recently obtained in 2010. Over the course of nearly 60 years, the company has transformed itself a number of times, from a provider of labels to an innovator of the very latest in drug delivery technology.

“Really, the company had to evolve,” offers Andy Rensink, Tapemark’s president and COO. “Labels are a price-driven commodity, but during this evolution, we’ve always stayed close to our core competencies around web handling,” he continues.

“Understanding how to work with roll materials and laminants in tight-tolerance applications enabled more intricate drug delivery applications. Handling web materials and understanding coating capabilities led to our ability to accurately dispense an active pharmaceutical ingredient (API) onto a pad as part of a transdermal patch.”

Tapemark’s current capabilities in handling pharmaceuticals (both prescription and over-the-counter), as well as their packaging or delivery devices, are expansive and include:

- Soluble film conversion.
- Wound care and specialty bandages.
- Topical patches and pads.
- Transdermal delivery applications — both active and passive.
- Product design and development.
- Dispensing and coating (non-pill applications).
- Integrated laminating, precision die-cutting and web handling.
- ISO 9001 and 13485 certification, as well as EU compliance and certification in Japan.
- Snap®! Technology, which was developed by Tapemark. This single-dose packaging product can be used to dispense a pre-measured dose of a semi-solid.

Seeing Is Believing

While the destination has proven to be worth it, the journey that Tapemark undertook was not a simple one. From huge investments in infrastructure and equipment to audits and regulatory approvals, the company’s gradual transformation demanded significant commitments.

All manufacturing is done at Tapemark’s multi-building campus in West Saint Paul, Minnesota. And although there were many synergies leading to the growth in contract pharmaceutical manufacturing, there are still a number of new demands. In particular, the company has had to continuously update its equipment and facility

to meet customer expectations.

Being a CMO, the overwhelming majority of what Tapemark does is unique to that individual customer. Obviously this demands equipment that can handle many of these customized requirements. “We’ve fostered excellent relationships with equipment suppliers,” states Rensink. “This has been key in establishing our drug delivery technology, as the equipment is configurable and customized. Our engineers work with our suppliers to design and build equipment that optimizes manufacturing efficiencies while supporting the unique needs of each customer's product.”

These customized modular pieces of equipment allow Tapemark to process unique materials and medicines in varying quantities, scalable from trials to mass production. The modular aspect also provides smoother transitions between different product runs, therefore reducing change-over times.

In addition to investing in customized equipment, Tapemark has had to make some significant changes in its facility. One that comes to mind for Rensink was the investment in multiple clean rooms with $10 million in pressure, particulate and temperature/humidity monitoring controls. Adjacent white rooms for packaging were also added.

“We have a mentality of always wanting to set the bar high, states Rensink. “So, this took a huge investment in clean rooms, air handling and training. However, this company has a history of innovation, and if we’re going to do something, we’re going to do it to be the best. In many instances, we know that if we built it, they [customers] would come, but we had to make the investment first in order to show that we were serious about our commitment to pharmaceutical contract manufacturing.

“We also knew that we had to get customers or prospective customers on site to see in person how we perform. When people see the operation, they get it and understand why our quality system is so effective. Getting the total picture from an on-site visit really enhances customer expectations and confidence in what we can accomplish,” offers Rensink.

Rensink feels the results of such investments have given Tapemark a couple of key competitive advantages. “There are a lot of CMOs who can do tablets and vial filling, but not a lot are competent at web-handling and converting,” he states. “Traditionally, that had to be done internally, but now companies can come to us. We’re also in the unique position of understanding both the device and pharma worlds in developing and producing combination products.”

This understanding has allowed Tapemark to be a one-stop shop for many major players in the pharmaceuticals marketplace. There are also a number of other trends that Rensink feels Tapemark is well-positioned to handle.

“Big pharma now understands what CMOs can do and how quickly they can do them,” he states. “In the last five years, there haven’t been many new, big

blockbuster drugs and patent protection is running out on others.

“So in meeting consumer’s expectations, big pharma needs to get new products to market more quickly. In the past, they would spend millions on research and development in the hopes of developing a billion-dollar drug. Now, they take 10 good products that net $50 to $100 million instead. This leads to looking for more unique deliverables, and buying more companies or products that are in the later stages of development. When they do this, they need someone to help customize the deliverable and that’s where we’re able to help.”

In addition to working with traditional pharmaceutical manufacturers, Tapemark also works with a number of specialty and "virtual" companies that outsource most aspects of their work. In these situations, Tapemark helps connect customers with organizations up and down the supply chain, such as formulators, compounders and marketing partners.

Looking ahead, the Rensink feels Tapemark is well-positioned for the future. "We see much consternation in the industry about drug vs. device regulations and how they differ," he states. "We went through that learning curve already, and as a result, we've built a quality system that supports both." More specifically, Rensink feels the company's capabilities in manufacturing drug/device combination products, such as transdermal patches, will continue to drive additional long-term growth.

Ahead of the Game

Perhaps no American company is more synonymous with continuous improvement strategies and Six Sigma practices than General Electric (GE). So when Rensink joined Tapemark in 2005 after 10 years at GE, the company inherited a genuine champion of this lean manufacturing methodology. If you need any further proof, the 160-employee company currently houses nine Six Sigma black belts and every employee has taken part in continuous improvement training as well as at least one Kaizen event.

Fueling Tapemark’s drive towards not only greater production efficiency, but success and passion for the company’s goals as well, are core values established by the founder. Robert Klas, Sr. instituted ERICKA — excellence, responsibility, integrity, community, knowledge and attitude — as the foundation on which the company stands. ERICKA, however, is not just about manufacturing, but pursuing excellence in every arena where Tapemark is present. “These core values make pharmaceuticals a good business to be in,” adds Rensink.

So with this mantra fully ingrained within the company’s culture, it should come as no surprise that quality by design (QBD) principles have been key to Tapemark’s success. “In our QBD program, we want to identify key performance indicators early on so we know what’s different or what differentiates this particular product or process, and can plan appropriately,” says Rensink.

“This approach helps to educate the customer and make them an even more

important part of our structured product development process," he adds. "With over two dozen commercial product launches in the last two years, we couldn't have done it with a very structured QBD process."

Moreover, Rensink says he feels most customers are gradually getting on board with QBD, but potentially the biggest obstacle is the need to initiate a structured approach as early as possible. This helps define more product attributes and analyze the project's overall feasibility by examining several of the most critical elements. If these issues cannot be addressed or help support the investment, then less time, money and material is wasted.

Tapemark conducts its failure measurement effect analysis (FMEA) tests very early. "We get our cross-functional teams (which include members from engineering, quality assurance, quality controls, purchasing, estimating, manufacturing, sales and customer service) involved right away, and divide the project up by process, not function," states Rensink. This has led to Tapemark rejecting some projects because they didn't make it past a feasibility study that examined the company's core capabilities vs. the project's unique needs.

"Basically, we don't want to limit our success by not knowing enough about the API, the device or the necessary process," adds Rensink. "The fewer unknowns, the better. It's a big investment for some to make, but this approach has been key in uncovering problems that weren't anticipated or initially understood."

Tapemark follows a five-state project development phase process that it describes as comprehensive, controlled and customer-involved to help ensure continued success down the road. The five phases are:

1. **Feasibility.** Does this project fit Tapemark's capabilities and resources?

2. **Process Development.** The necessary materials, equipment, processes and quality requirements are defined and understood by Tapemark and the customer. Formal measurements, using final equipment, are also confirmed in a process capability study.

3. **Process Qualification.** Establishing documented evidence through appropriate testing that finished product, manufactured by a specific process, is effective, reproducible and meets all requirements.

4. **Process Validation.** Based on regulatory requirements, assurance is provided that the process can consistently produce product that meets specifications and quality characteristics.

5. **Commercial Product.** The product is launched, and Tapemark manages materials, scheduling, capacity, staffing and tracking controls to meet delivery and regulatory requirements.

In addition to the all the checks and communication entailed within each portion of the process, phase reviews with the customer are conducted at the end of every stage.

“I think more manufacturing jobs should be focused on better understanding and applying QBD and Six Sigma,” offers Rensink. “And pharmaceutical manufacturing is the perfect fit. Better processes focused on improving quality translates into better medicine with fewer unforeseen costs that drive up health care prices.

“Pharma is a bit late to the lean game, but CMOs can be at the forefront of making it work,” continues Rensink. “For example, FDA compliance is based on making processes repeatable, documentable and standardized to ensure product safety, but these specifications don’t necessarily relate to manufacturing efficiencies. The industry is ahead of the FDA in regard to continuous improvement focus, lean manufacturing and Six Sigma.

“So the sooner a CMO is involved, the greater impact it can have. Helping design the product, the packaging and the process, with the customer, ensures manufacturability, improves cost-effectiveness and prioritizes quality,” he concludes.