Creating Sustainable Concepts

Intelligent Engineering for Optimized Pharmaceutical Manufacturing Processes

ACG, founded as Associated Capsules Group in 1961, today serves pharmaceutical and nutraceutical companies all over the world. As a supplier of integrated manufacturing solutions to these industries, the India-based group offers a complete range of solutions: beginning with empty capsules; granulation and coating; capsule filling; tableting; packaging films and packing, as well as end-of-line solutions with almost 24,000 machine installations worldwide. In March 2023, ACG announced that Richard Stedman will be re-joining the group as the CEO of its Engineering division, a position he had held from 2017 to 2021. CHEManager asked him to analyze current market trends and present his strategy to further develop and grow the engineering business.

CHEManager: How has the pandemic and its repercussions changed the industry and the markets? Which challenges are ACG's customers currently facing?

Richard Stedman: I'd argue that one of the biggest challenges the pharma industry is currently facing is that of supply chain disruption. This started in 2020 during the Covid pandemic and has intensified over the last couple of years. At ACG, we have had to be agile in our response to the situation to continue to deliver on our promise to 'make it better' for our clients and end-users. We're now learning how we are going to live with and manage the disruptions that will undoubtedly continue to prevail—creating significant delays and issues for our sector. The industry has had to adapt accordingly in order to continue successfully delivering services to end users.

Talent shortages are also creating difficulties for the industry—finding qualified associates and professionals has become a difficult task. The sector needs people with an understanding of the pharma manufacturing processes to be able to help solve the growing challenges the industry is facing. One example is the issue of how to collect, manage and analyze data, whilst providing security and encryption assurances.

What are the lessons learned from the global supply chain disruptions caused by the pandemic? Have your customers changed their approach to safeguarding the supply of critical components?

R. Stedman: Shortages of raw materials are continuing to yield severe pharmaceutical manufacturing supply line disruptions. In some cases, European manufacturers are experiencing a doubling of supplier lead times, uncertain and fluctuating prices, and orders that are often subject to delays. Numerous additional sector threats including soaring inflation and global talent shortages have left many manufacturers with plants not operating to full capacity—compounded by increases to overall running costs.

As our head of global supply chains, Nikunj Desai, commented: "Looking to Darwin's philosophical reasoning: 'It is not the most intellectual of the species that survives; it is not the strongest that survives, but the species that survives is the one that is able best to adapt and adjust to the changing environment in which it finds itself'." In an article published at the end of last year, Desai advised that: "Now, during one of the greatest manufacturing crises on record, is a time to consider doing things differently rather than accepting the scarcity of multiple resources and running a leaner operation to match."

To ensure they are able to weather this current—and future—crises, customers are having to strengthen their processes when it comes to a number of factors.

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Richard Stedman, CEO, ACG Engineering

Can you explain some of these factors in more detail?

R. Stedman: These factors include the following:

More resilient supply chains—built on strong foundations with robust processes and systems that enable their stakeholders to have full visibility and subsequent control.

Managing risk—anticipating potential disruptions and building resilience to adapt to unforeseen events.

Track and trace—being able to identify products' whereabouts in the supply chain is also key—from production through to delivery.

Process automation—reducing errors and increasing accuracy and precision.

To better understand how ACG is positioned to support their customers in managing these challenges, please give us a quick overview of ACG Engineering's core competences and capabilities.

R. Stedman: For more than 60 years, ACG has been committed to 'making the world better' by providing materials, equipment and technology to the pharma industry, helping its customers to provide products to the end user, so they can have a better life.

ACG is the world's only integrated pharma manufacturing solutions company, with products ranging from capsules to films & foils, to engineering equipment and inspection systems—all that meet international regulatory requirements. For ACG, it's always about finding innovative solutions to the world's greatest health challenges, together.

ACG's Engineering provides end-to-end pharmaceutical engineering solutions, manufacturing tablet press, capsules filling and packaging machines.

The company also continues to grow its packaging solutions across the global customer base. Customers are able to leverage the synergy across the ACG Engineering business or combination supply arrangements, leveraging both engineering solutions combined with the supply of ACG Capsules and/or Films and Foils. ACG has a unique unmatched consumables and machine supply value proposition—One ACG.

So, how can ACG Engineering help customers to strengthen their processes and drive pharmaceutical innovation while at the same time meet regulatory as well as qual-

ity, anti-counterfeiting, and cost efficiency requirements?

R. Stedman: ACG machines and processing technology are prepared and equipped for the future of pharma. Our focus is centered around optimizing processes and working to reduce downtime.

Regulatory compliance will continue to be a top priority in pharmaceutical machine manufacturing. Stringent regulations governing the production of pharmaceuticals, including tablets and capsules, will drive the development of machines that ensure compliance with good manufacturing practices—GMP—, international standards, and regulatory guidelines. This will involve robust documentation, validation and qualification processes to ensure the safety, efficacy and quality of pharmaceutical products.

Developments in pharmaceutical machines, including automation, advanced sensors and monitoring systems, material handling and feeding systems and improved machine design have resulted in increased efficiency, precision and quality in manufacturing processes. As a result, this has hugely benefitted the pharmaceutical industry and—ultimately—the patients who rely on these medications for their health and wellbeing.

ACG has redesigned and realigned its entire documentation suite to meet international compliance requirements.

We are also changing how we optimize our equipment. For example, we are looking at digital twins during design and maintenance, and how we replicate in order to increase output and the lifetime of the machine.

Digitalization has umpteen of faces; how will digital solutions transform drug formulation and pharmaceutical manufacturing?

R. Stedman: Pharma 4.0, digitization and automation are game changers and will lead to exciting changes and developments in the next generation of machines. We will witness the integration of cutting-edge technologies, such as artificial intelligence—AI—, machine learning—ML—, and the Industrial Internet of Things—IIoT—, into pharmaceutical machines to enhance their efficiency and precision. This will result in increased productivity, reduced downtime and improved quality control, leading to higher yields and cost savings for pharmaceutical manufacturers and lowering the total cost of ownership.

There are also massive amounts of data being created in the industry, and how we use this moving forward is hugely exciting. Utilizing smart connected machines and IIOT helps our customers to combine reality with the digital environment.

ACG Engineering has had success in working with customers partnering in developing systems to monitor stoppages/downtime and improve productivity. ACG has the advantage of developing these digital proof of concept models in its own manufacturing facilities and applying the learnings very successfully to customer solutions.

Sustainability is today's buzz word, and manufacturers constantly look to optimize their equipment's energy and performance efficiency. How can ACG Engineering support them?

R. Stedman: There will be a growing emphasis on sustainability and environmental consciousness over the next decade. Pharmaceutical machine manufacturers will continue to focus on developing eco-friendly machines that minimize waste, reduce energy consumption and comply with stringent environmental regulations. This will involve the use of renewable energy sources, the implementation of green manufacturing practices, and the adoption of recyclable and biodegradable materials across machine components.

Sustainability is a driving force in ACG's initiatives. This includes changes to the raw materials that are being used and how we can reuse, recycle and reduce to create sustainable concepts in the design of the machine for a healthier future.

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