News Release

Portescap

Portescap's new miniature motor R&D facility increases customization capability

The design and development of miniature motor motion solutions is integral to applications from medical equipment to robotics through to industrial power tools, in settings that demand performance and reliability. Concept design, development and testing not only has to be rigorous and relevant to specific application conditions, but also has to be fast enough to meet the needs of demanding markets. As a result, Portescap, which develops miniature motors for global OEMs, has enhanced its R&D capabilities by creating a new Engineering Lab.

The Covid-19 pandemic meant that fast reaction was needed. A key requirement for the medical care of patients who had contracted the virus was the use of ventilator machines, and with high and urgent demand, new machine designs were needed that could rapidly fill the gap. A ventilator OEM in India turned to Portescap's Mumbai team for a fast yet reliable motion solution. The company's new Engineering Lab had recently come on-line at Portescap's Mumbai facility, which allowed a suitable miniature slotless, brushless DC (BLDC) motor to be designed, tested and then brought into production quickly.

"While Portescap has R&D expertise and facilities in Switzerland, the United States and in India, the new Engineering Lab in Mumbai has enhanced the company's ability to quickly develop new products for production, meaning a faster time to market for our customers," says Dheeraj Saxena, Portescap's global head of research & development.

The new Engineering Lab has been developed to enhance miniature motor design across worldwide markets. Ideally located in close proximity to the company's India production facility, the expertise of the Mumbai Engineering Lab team will develop solutions for customers in India selling globally, as well as supporting the company's international R&D capability which creates products for use worldwide.

The facility will develop miniature motors to standard designs for large-scale markets, where the Mumbai team will assist Portescap's global R&D capability in bringing new products to market. In addition, a particular focus for the Engineering Lab includes custom OEM projects.

"Our DNA is to provide custom motion solutions, and that's where we work very closely with customers," says Dheeraj. "The Switzerland and U.S. teams have their own expertise, and the new Mumbai Engineering Lab will support the customization development for customers worldwide."

In the US, the focus for Portescap is to design and develop slotted BLDC custom motion solutions to maintain its leading position in the surgical motion solutions market. Meanwhile, Portescap's

Switzerland team designs and develops BLDC slotless motion solutions motors manufactured in Mumbai.

The new Engineering Lab means that the Mumbai team will now also support BLDC slotted flat motion solutions for the global robotic and surveillance market in addition to its expertise with DC and stepper motion solutions. This covers applications such as surgical robots and surgical tools, ventilators, medical infusion systems, as well as industrial power tools. The facility will also focus on emerging markets, enabling Portescap to utilize its technology to meet new demand, part of the company's 'Dream, Develop, Deliver' concept.

"Our approach covers theoretical designs and prototyping through to manufacture. It helps us create the highest performance, most reliable motion solutions for compact applications, and also enables us to accelerate the development of a miniature motor package for the benefit of our customers. The new lab is integral to this," explains Dheeraj.

Important for standard products but crucial for bespoke development is the proof of concept stage. As part of this, the new Mumbai lab includes in-house 3D printing, enabling the team to rapidly create and test designs. This can involve customizing standard parts for fast delivery, utilizing existing projects from the company's customization portfolio, or creating entirely new designs.

"With 3D printing we've been able to manufacture parts that would have been difficult to manufacture otherwise, especially at high speed and using new materials, so the ability to achieve this in-house is certainly advantageous for our customers for fast development," says Dheeraj. "The capabilities of the new lab will also help our global teams receive prototype parts more quickly from our Mumbai factory, speeding up application development around the world."

To validate concepts and prototypes for production, the Mumbai Engineering Lab includes testing across all miniature motor characteristics, such as performance, torque and noise, as well as life testing to ensure long-term reliability of motors for critical applications. Specific to Portescap's customization ethos, the new lab is also able to recreate field conditions for dedicated applications. Simulation techniques in virtual and live situations include aspects such as direction of rotation with variable load.

"Portescap typically uses its own design and testing methodology for performance and life testing, relating to the duty cycle of a specific application," explains Dheeraj. "We try to model performance and reliability characteristics as closely as possible, based on customer feedback, our analysis of the existing application, as well as our experience of previous, similar examples. The results are very realistic to actual field use."

Facilities at the new lab include an environment chamber to test a motor against various temperatures and humidity, as well as an autoclave tester for sterilization applications such as surgical hand tools. The lab also includes an NVH (noise, vibration, harshness) chamber for analysis over varying duty cycles. In addition to the latest test technology, the facilities require subject matter experts to optimize the procedures.

“Our subject matter experts cover aspects such as gearing transmission and noise, electromagnetic designs, materials, and reliability,” explains Dheeraj. “As a result of their experience in analytical procedures, these experts enable us to bring a product to market more quickly. Similarly, this capability is also focused on problem solving for specific customers, such as simulation techniques and acoustic modelling, enhancing our capabilities for the validation of bespoke applications.”

In addition to the capabilities of the facility, the new Engineering Lab is significantly larger than the Mumbai team’s previous site. This brings a higher capacity of testing of products and composites, meaning that applications can be validated for customers at a faster rate.

“Both Portescap’s Switzerland and USA teams have excellent labs with staff for design and prototyping. With India’s new facility and subject matter expertise, we’re complementing our global team,” says Dheeraj. “We operate as one team, problem solving for faster time to market for customer solutions. The new lab is part of an evolving development that will see Portescap resolve customer challenges into the future.”

About Portescap

Portescap offers the broadest miniature and specialty motor products in the industry, encompassing coreless brush DC, brushless DC, stepper can stack, gearheads, digital linear actuators and disc magnet technologies. Our products have served diverse motion control needs in a wide spectrum of applications including medical, life science, instrumentation, automation, aerospace and commercial for more than 70 years.

Portescap has manufacturing centers in the United States and India and utilizes a global product development network with research and development centers in the United States, China, India and Switzerland.