

Tackling Manufacturing Challenges with Transformative Electric Motor Design Technology

This case study, conducted in partnership with our global manufacturing partner, **East West Manufacturing**, highlights how **ECM's PCB Stator** technology and **PrintStator Motor CAD** platform address common manufacturing challenges

CHALLENGE

In today's competitive manufacturing landscape, companies face mounting pressure to innovate while reducing costs, accelerating time to market, and achieving greater product optimization. However, traditional motor solutions often limit flexibility and efficiency, making it difficult to meet these demands. Compounding the challenge, product development teams frequently struggle to minimize lost revenue, capital expenses, and overhead costs—factors that are critical to a product's true competitiveness.

By enabling transformative advances in motor customization, product development, and system-level performance, ECM provides a path for manufacturers to innovate faster and more effectively while unlocking greater value.

"East West offers global manufacturing services offering enterprises a seamless path to scale and an exceptional speed-to-market strategy while driving down costs and adhering to the highest quality standards."

"East West is proud to be partnered with ECM in bringing the quietest and most advanced new motor technology to market."

Scott Ellyson, CEO, East West Manufacturing

SOLUTION

PCB Stator Technology

ECM combines advanced Motor CAD with patented PCB Stator technology to create electric motors that are lighter, quieter, more compact, and energy efficient. PrintStator, with integrated PCB Stator technology, allows manufacturers to fully optimize motors to precise performance and dimensional specifications.

KEY ADVANTAGES OF ECM PCB STATOR TECHNOLOGY

Lower Capital Investment & Faster Time to Market

ECM's award-winning PrintStator SaaS platform designs motors that replace bulky copper windings with an ultra-thin disc. As a result, PrintStator-optimized machines are up to 70% lighter, over 90% efficient, use 80% less raw materials, and are up to 30 dB quieter than conventional options. This innovation also offers lower capital investment and a faster time to market by significantly reducing production complexity and prototyping time.

Custom Solutions & Compatibility

ECM's PrintStator Motor CAD software enables tailored motor designs that reduce costs from off-the-shelf component incompatibilities, such as voltage conversion or misaligned application needs. By reducing system complexity, ECM delivers optimized motors that integrate seamlessly into broader systems.

Size, Weight and Raw Material Reduction Benefits

The compact profile of ECM's PCB Stator motors unlocks significant design advantages. Smaller motors improve airflow in HVAC systems, optimize space in appliances, and unlock new possibilities for innovative product designs by addressing space constraints. With no iron core or copper windings, PCB Stator motors eliminate cogging entirely and reduce raw material usage by 80%, delivering both performance and sustainability benefits.

CONVENTIONAL MOTOR



PCB STATOR MOTOR



High-Mix Optimization: Streamlining Parts Across SKUs

ECM's PCB Stator technology, paired with East West's flexible assembly operations, enables standardized hardware packages across SKUs. This reduces manufacturing capital investments and eliminates the need for variations of winding programs or excess work-in-progress management. A single assembly line can serve multiple products, lowering overhead and streamlining production.

System Innovations Beyond the Motor

PCB Stator motors drive system-wide cost savings and innovations. Their compact size, zero cogging, and ultra-quiet operation eliminate costs associated with noise, vibrations, and mounting issues. By integrating motors directly into product assemblies, manufacturers reduce overall costs while enhancing performance and efficiency.

COST BREAKDOWN

Below is a table outlining the differences between the development of ECM's PCB Stator motor solutions versus traditional motor solutions, illustrating the savings and value provided by our technology in partnership with East West Manufacturing.

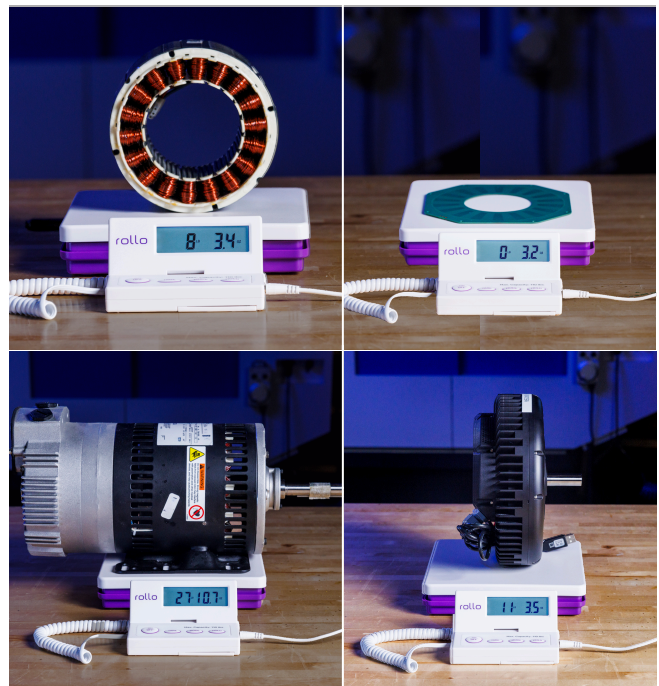
Criteria	Custom ECM PCB Stator Motor	Custom BLDC Motor
Est. Tooling Investment	<p>Low</p> <p>(Leverage existing PCB manufacturing practises)</p>	<p>High</p> <p>(Typically, around 2x a PCB Stator motor due to specialized stamping and winding equipment required)</p>
Est. Time to Prototypes	<p>~4-6 months</p>	<p>~12-18 months</p>
Est. Time to Market (After Prototype)	<p>3-4 months</p>	<p>3-5 months</p>
Performance Risk	<p>Low</p> <p>(Robust Design Software, Support From EW & ECM)</p>	<p>Low</p> <p>(Robust Design Software, Support From EW)</p>
Cost Risk	<p>Medium</p> <p>(Magnet Price Volatility)</p>	<p>Medium</p> <p>(Copper, Electronic Component, and Magnet Price Volatility)</p>
Quality Risk	<p>Medium</p> <p>(Simple Motor Manufacture)</p>	<p>High</p> <p>(New Design, Requires Qualification and Testing)</p>
Scalability	<p>High</p> <p>(Scalable Design)</p>	<p>Low</p> <p>(Tooling Specific to Project)</p>



In a recent test, the blender unit powered by ECM's PCB Stator motor operated 29 dB quieter than a conventional motor.

CONCLUSION

ECM's PCB Stator technology offers companies a compelling alternative to traditional motor solutions, as shown in the research undertaken with East West. By reducing capital investment, speeding up time to market, and enabling system innovations, ECM's technology is ideal for businesses looking for flexibility, rapid prototyping, motor designs that will optimize their products and systems. The advantages in noise reduction, weight, and overall system performance provide further value, making PCB Stator motors the go-to choice for forward-thinking manufacturers and product innovators.



ECM's PCB Stator weighs over 8 lbs (3.5 kg) less than a comparable conventional copper-wound stator and 16 lbs 7 oz (7.46 kg) less than a motor with equivalent power output.

NEXT STEPS

To learn more about how ECM and East West Manufacturing can help revolutionize your motor development processes, [contact us today](#). We look forward to helping you unlock the full potential of PCB Stator technology in your next project.