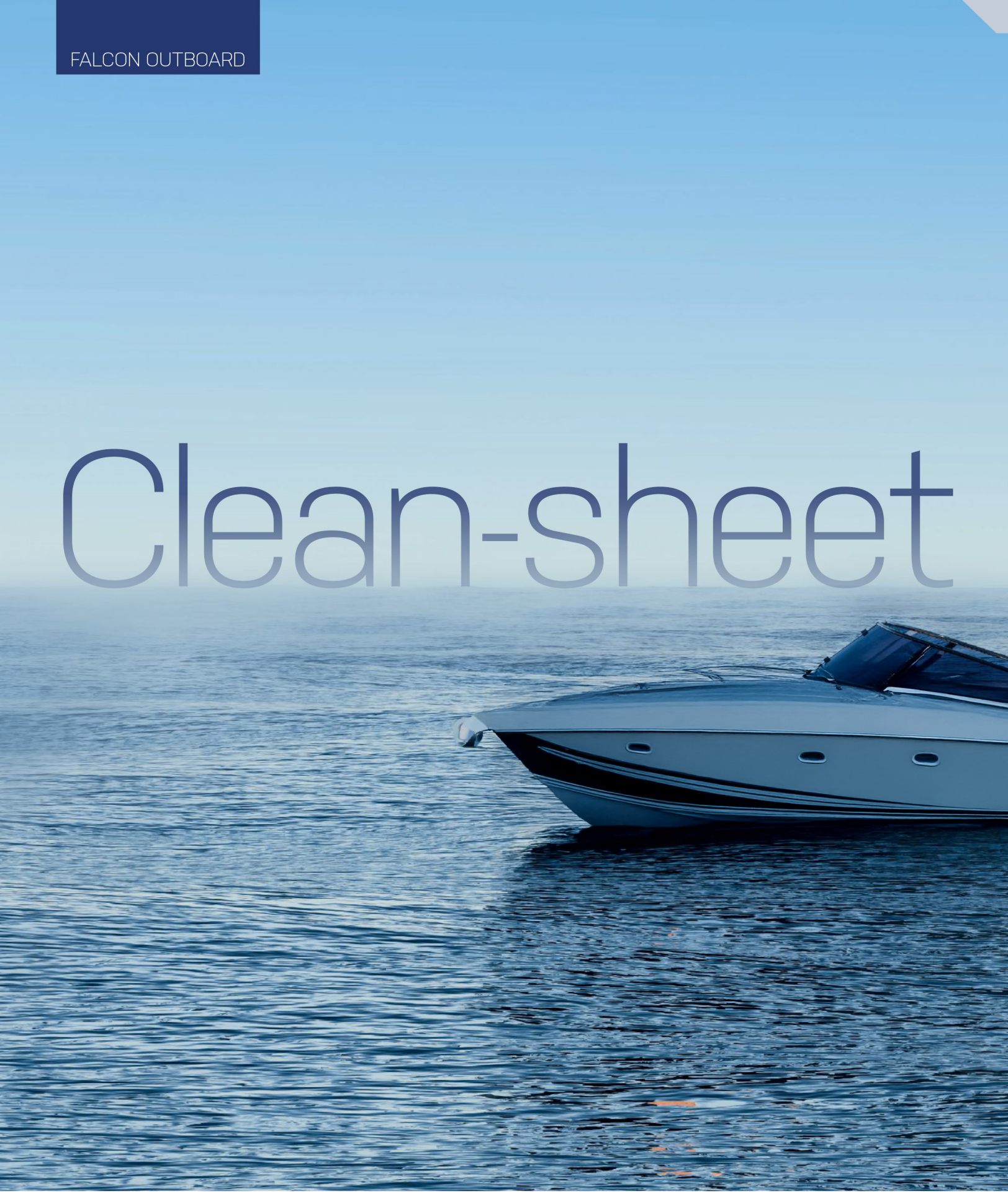
Clean-sheet



design

Inside the development process for EPTechnologies' new electric outboard

WORDS: **MATT ROSS**

EPTechnologies opted to design the Falcon from the ground up, optimizing the outboard for electric propulsion from day one

"Designing and manufacturing our batteries in-house gives us the flexibility to tailor them exactly to our specifications"

Kasper Falkenberg, EPTechnologies

Last November's METSTRADE saw the unveiling of the new Falcon electric outboard from Danish drive system and battery developer EPTechnologies. The developers claim that the new system is the lightest, quietest and most efficient outboard in its class, so *E&H Marine* caught up with Kasper Falkenberg, CEO and founder of EPTechnologies, to find out more about the new technology, and why designing the Falcon – named to recognize the swift and graceful movement of the fastest animal in the world – from the ground up was integral to its unique performance characteristics.

What were the design priorities when starting work on the Falcon outboard? Which performance metrics needed to be met?

The main priority was to develop an outboard motor that is engineered for electric propulsion from the ground up. This means every part of the design, from the shape to the drive system, is optimized for electric power rather than being adapted from gasoline-based systems. We originally set ourselves the ambitious targets of achieving 110kW and 180kW, as this covers the broadest power range for electric outboards and there are fewer competitors in this segment.

When did work start?

The groundwork began about a year-and-a-half ago, with an initial focus on securing financial support, which was key to moving forward. After successfully receiving funding, we officially launched the project in December 2023. Our team expanded as the project progressed, with additional specialists joining at various stages to meet the growing needs in development, testing and production.

What are the advantages of a ground-up design over working with an existing platform?

Building from scratch enabled us to achieve a much lighter and more compact design that takes up less space on board. This leaner form also simplifies the installation of dual or even triple outboard motors, which can be a challenge with larger, conventional systems. Overall, it's a cleaner and more refined approach than retrofitting an existing platform.

Why axial flux technology?

Axial flux technology is one of the latest innovations in motor development, known for its ability to deliver outstanding power with much less weight. For the Falcon, this technology provided an efficient way to maximize power without adding unnecessary bulk, which is crucial in marine applications where weight reduction and space efficiency are critical.

The motor has a reimagined steering system. Was this always the intention?

Yes, rethinking the steering system was always part of our vision. From the start, we aimed to create an innovative steering solution that would improve the overall handling and ease of use, so it was an essential aspect of the design from the earliest stages.

What advantages does it offer to have the system steer in this way?

With its compact design, the new steering system saves valuable space, offering greater flexibility in onboard design. It incorporates advanced technology that eliminates moving cables, which reduces both maintenance and wear on parts. This is not only safer but also results in a smoother and more durable steering system.

How and where was the new outboard tested?

We were fortunate to have access to our own testing pool and dedicated boat, so we could fully control and monitor all aspects of performance. This setup enabled us to fine-tune every detail of the Falcon in a stable and reliable testing environment.

What did you learn during the testing process?

As we're still in the initial testing stages, it's too early to present conclusive results, so we're holding off on sharing specifics for now. However, as our testing continues and we confirm that the Falcon satisfies all performance and reliability criteria, we'll be happy to provide further updates.

What advantages does using your own batteries bring to the project?
Designing and manufacturing our batteries in-house gives us the flexibility to tailor them exactly to our specifications and ensure they are as lightweight as possible. The combination of a tailored battery and our motor developed from the ground up creates an exceptional package that optimizes weight distribution and maximizes space efficiency.

What benefits does that give over using a bought-in battery?
Right now, we're focused on using only our own batteries, as this allows us to control compatibility and uphold our standards as a full-service provider rather than a component supplier. While our approach may evolve in the future, our current setup ensures each Falcon motor performs at its best with a perfectly matched, in-house-developed power delivery system.

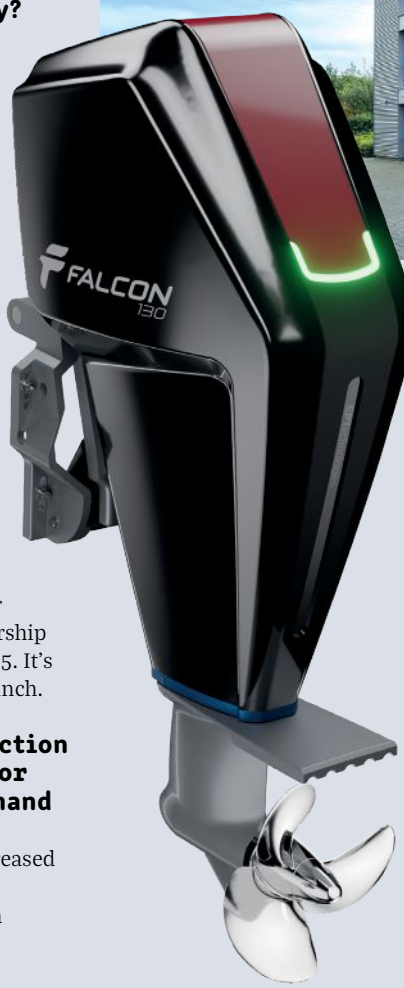
Where is the Falcon outboard being produced?
The Falcon is being produced in Denmark. Keeping production local gives us tighter control over quality and allows us to manage each step of the process closely.

When will it be on the water?
The Falcon is already operational on our test boat, and we expect our first partnership projects to take to the water early in 2025. It's exciting to see it getting closer to full launch.

Are you having to scale production of the motor (and batteries) for the expected interest and demand for the Falcon?
Yes, absolutely. We're preparing for increased demand, and scaling production is a top priority to ensure we can supply enough units to meet the expected demand.

Right: EPTechnologies' facility in Denmark

Below: The Falcon produces 130kW, with a 230kW version due to be released in 2025



"Every part of the design, from the shape to the drive system, is optimized for electric power"

Can you tell us anything about the first applications?
We will initially focus on leisure boating and the commercial sectors. The Falcon is suited to both segments.

What's the timeline for the 230kW version of the outboard?
Following the introduction of the 130kW model, the 230kW version is scheduled for release about two months later. This upgraded version will offer greater power and broaden our product portfolio.

What applications do you see the 230kW version being used for?
We expect the applications to be similar to those of the 130kW version. It's equally suited to leisure and commercial uses, with the added benefit of increased power for those who may need it.

Are there plans for further variants based on this platform?
Yes, if the market demand is there. We're equipped to develop further variations to meet specific needs as they arise, and adapt the platform to suit a range of requirements.