AKERBOOM
yacht equipment

Innovation Report

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The Akerboom Yacht Equipment Innovation Report provides an overview of current engineering developments across our portfolio. In this edition, the Spotlight focuses on a composite gangway hatch, where spatial constraints and weight reduction led to a fundamental shift in material strategy and execution.

Behind the Scenes highlights the refinement of critical systems through operational feedback and feasibility studies, while Future Focus explores the scaling of modular boarding ladder systems to meet increasingly ambitious design requirements.

Together, these developments reflect Akerboom's ongoing commitment to technical precision, practical innovation, and engineering excellence in superyacht equipment.

Innovation Spotlight: Composite Gangway Hatch

The Spotlight section takes a closer look at one innovation in greater technical depth, focusing on the challenges, decisions, and engineering trade-offs that shape the final solution. Rather than presenting innovation as a finished product, it reflects the process behind it: from initial constraints to material choices and system integration. In this edition, the Spotlight highlights a development where rethinking the original approach led to a fundamentally different execution.

Design Constraints and Spatial Reconfiguration

In line with earlier developments around the open beach club experience and aft deck configuration, Akerboom's latest innovation focused on a challenge resulting from specific gangway housings. Recent yacht designs no longer allowed for a standard gangway housing box integrated into the ceiling of the beach club, sometimes due to the size and position of the pool above, and in other cases to maximize ceiling height and spatial openness.

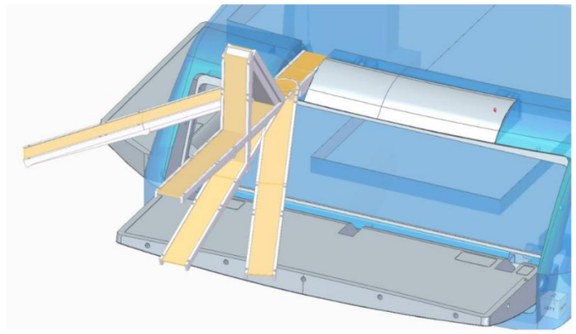
As a result, the gangway is now stored at the aft, positioned sideways along the main deck. This configuration required a completely new hatch design, resulting in a specially engineered gangway hatch with extended length and complex curvature. The shape and dimensions were developed to follow the aft deck geometry while maintaining clean integration within the yacht's exterior lines and overall beach club concept.

From Aluminium to Composite: A Material Shift

This development is not entirely new, as similar configurations have been implemented on earlier Feadships. What made this innovation unique was the choice of materials. During the early stages of the project, the gangway hatch was conceived as an aluminium solution, which was technically sound and commercially approved.
As engineering progressed, however, it became clear through close collaboration with the shipyard that the available installation space and service accessibility for the drive motors were insufficient in relation to the aft swimming pool configuration. There was simply not enough space to position the required drive components without compromising accessibility and long-term serviceability. Given the functional and structural importance of the pool's location, the question arose whether the hatch could be executed differently.

A key complicating factor was the required exterior finish. The gangway hatch would be fully clad in teak, adding significant weight to the structure. Increasing the size or power of the drive system was not desirable, as this would further increase space constraints and complexity.

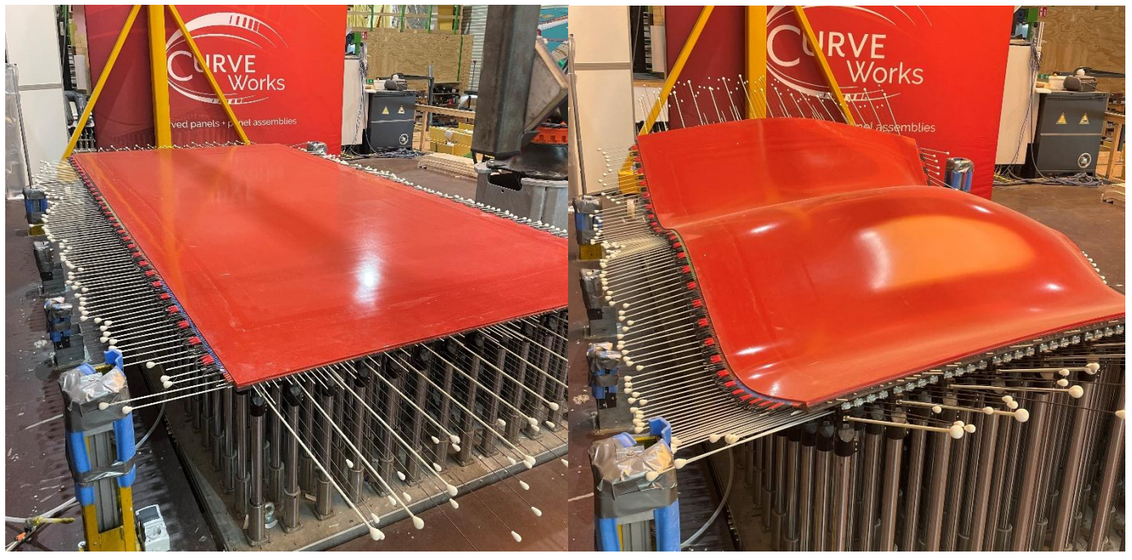
The only viable path forward was therefore to reduce the structural weight of the hatch itself, leading to a reconsideration of the base material and exploration beyond aluminium.



Composite Development and Production

Following approval from the project team, Akerboom initiated the development of a composite-based solution. In collaboration with our supplier Curve Works, the focus shifted to identifying a composite construction method that would provide sufficient stiffness and strength while significantly reducing weight.

The hatch was developed directly from detailed 3D geometry, allowing it to be produced with high dimensional accuracy in the workshop. This reduced adjustment work on board and improved installation efficiency.



After completion, the hatch underwent a quality control inspection to verify dimensional accuracy before installation. Once fitted, it was finalized in line with Akerboom's aluminium equipment to ensure proper alignment and integration with the surrounding structure. The composite hatch is supplied with a base paint system,

after which the exterior surface is finished with teak cladding in accordance with the yacht's design requirements. At the time of writing, the yacht remains in the final outfitting phase and is scheduled for launch later this year.

Technical Outlook and Certification Path

From a technical perspective, the composite hatch concept offers a high degree of flexibility. The construction allows for a wide range of surface finishes, including painted systems, teak cladding, or intermediate solutions. Different composite manufacturing techniques can be applied depending on geometry and load case, allowing the concept to scale across configurations.

While classification approval has not yet been obtained for the current execution, discussions are ongoing to explore certification possibilities for future applications.

Behind the Scenes: Locking Cylinders and Acoustic Behavior

Innovation at Akerboom does not only manifest itself in visible new products. It also takes shape in the continuous refinement of existing systems, the investigation of unexpected behaviors in real-world conditions, and the feasibility studies that explore the outer limits of what is technically possible.

This Behind the Scenes section highlights two such cases: one rooted in operational feedback from vessels in service, and one originating from an exploratory engineering study that pushed the boundaries of scale, integration, and structural behavior.

System Design and Functional Requirements

A key requirement for hull doors and similar openings is the ability to close and lock safely under all operating conditions at sea. Akerboom developed a compact, hydraulically operated locking cylinder in-house, designed to meet classification society requirements while remaining as space-efficient as possible.

The system is available in ATEX configuration and uses a superduplex locking pin rather than standard stainless steel, providing increased strength and corrosion resistance. Minor surface damage or flash rust can be polished easily without affecting structural integrity, supporting long-term serviceability.

Operational Feedback and Acoustic Analysis

Based on operational feedback from several vessels, attention was drawn to occasional creaking sounds occurring during sailing conditions. Investigation identified the interface between the locking pin and the composite receiver as the main source.

The geometry of this interface is intentionally designed to allow controlled lateral movement caused by thermal expansion, hull flexibility, and local recess deformation, ensuring watertight integrity is maintained without over-constraining the structure. These functional requirements create a delicate balance between wear resistance, friction behavior, and acoustic performance.

Stick-Slip Effect and Ongoing Refinement

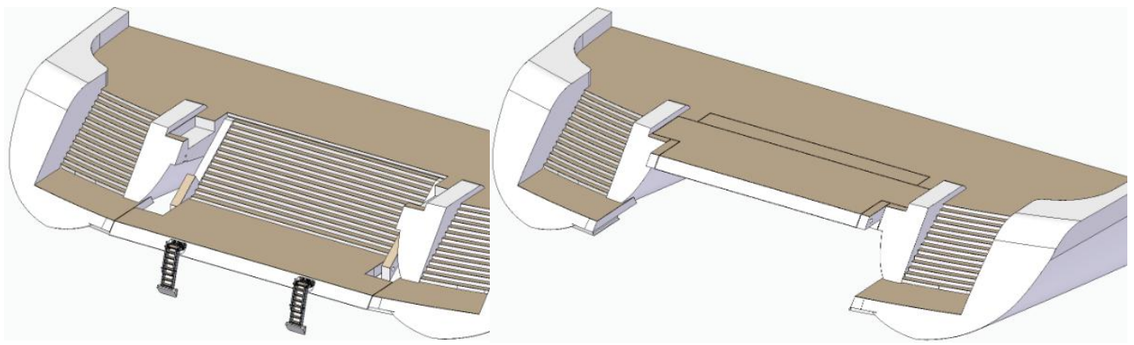
The composite receiver material performs optimally under specific load conditions. In certain scenarios, a stick-slip effect can occur, where static friction briefly builds before transitioning into lower dynamic friction, producing audible noise.

Together with material suppliers and regulatory bodies, Akerboom is currently exploring refinements to receiver materials and contact characteristics to further improve acoustic behavior while preserving the compact footprint, certification compliance, and durability that define the locking system.

Behind the Scenes: Large-Scale Aft Platform Feasibility Study

Akerboom is frequently asked to explore concepts that extend beyond previously realized solutions. In these cases, engineering begins with a feasibility study to understand structural limits, reaction forces, and spatial constraints before committing to a definitive design.

One such study focused on a movable aft platform for a large multihull vessel, where scale, functionality, and vessel architecture had to be carefully balanced. The vessel's beam was intentionally limited to approximately 30 metres to maintain Panama Canal compatibility, which placed additional constraints on the integration of large movable structures.



Functional Ambition and Spatial Constraints

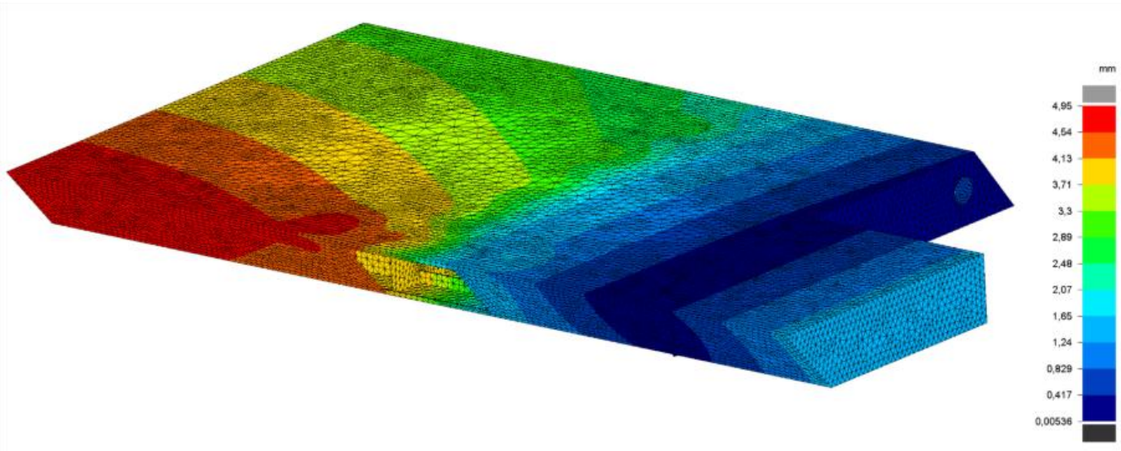
The requested platform measured roughly 12.5 metres in width and 6 metres in length and was designed to serve multiple purposes. When deployed, it would provide direct access to the water through integrated automated swim ladders and a full-width staircase connecting to the main deck.

When folded, the platform effectively enlarged the usable main deck area, creating a seamless extension of the aft space. Achieving this dual functionality required careful consideration of load paths, hinge placement, and drive integration within a confined envelope.

Structural Evaluation and Concept Outcomes

Akerboom developed a concept in which all drive components were concealed within the structure, maintaining clean exterior lines while protecting mechanical systems from the marine environment. Structural strength and deflection behaviour were evaluated through finite element analysis to ensure acceptable performance despite the extreme dimensions.

Although the study remained conceptual, it expanded internal knowledge on large-scale movable platforms and informed future approaches to combining structural efficiency, usability, and aesthetic integration.



Future Focus: Extended Boarding Ladders

The Future Focus section looks ahead at developments that are still evolving within Akerboom's engineering practice. Rather than presenting finished solutions, it highlights directions emerging from recent projects, technical questions that continue to shape product development, opportunities created by scaling existing systems, and broader trends that may influence future yacht design and equipment requirements.

These insights offer a glimpse into how current requests and engineering challenges inform the next generation of equipment, including this edition's exploration of longer boarding ladders and expanded modular capabilities. By examining these developments, we provide insight into the engineering considerations that guide future solutions and the gradual evolution of Akerboom's broader product portfolio.

Modular Scaling and System Evolution

At Akerboom, the expansion of the product portfolio often grows from existing modular building blocks. New solutions are typically developed by building upon proven hinge and drive systems, allowing innovations to remain aligned with established reliability standards.

In some cases, however, incoming requests require these modules to be scaled beyond their original design envelope. A recent example involves the evolution of Akerboom's boarding ladders with self-levelling steps, which were originally developed for ladder configurations of up to ten steps.

From Craftsmanship to Data-Informed Insight

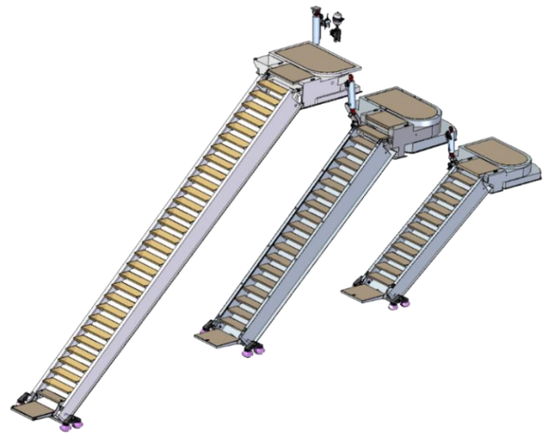
Within a short timeframe, two separate project requests pushed these boundaries significantly further, first toward a configuration of approximately twenty steps, and shortly thereafter toward a ladder concept extending up to thirty steps.

Responding to these requests required the development of larger structural and drive modules, effectively introducing two new upscaled building blocks into the modular system. This progression allows Akerboom to offer a broader range of ladder configurations, covering applications from compact boarding solutions to extended reach systems, while maintaining consistency in operation and integration.

Broader Design Implications

Beyond addressing immediate project needs, the heavier-duty modules open up additional possibilities for future designs. The increased capacity creates opportunities to explore wider boarding ladders, greater step counts, and expanded integration with swimlift platforms where both reach and width play an important role in usability.

While these developments are still evolving, they demonstrate how incremental scaling of existing technology can create new directions for design flexibility, supporting future yachts with increasingly diverse operational and aesthetic requirements.



The innovations shown throughout this Innovation Report illustrate how Akerboom evolves through practical engineering challenges, collaboration with shipyards and partners, and the refinement of proven systems. Together, they reflect our commitment to delivering reliable, well-integrated solutions that support the evolving demands of modern superyacht design. For more information about Akerboom Yacht Equipment and our developments, please visit: https://www.ayeholland.nl/

AKERBOOM

yacht equipment

“Enabling flawless experiences through craftsmanship and innovation”

Currently involved in building

>15

Number of employees

>120

Servicing per season

>130

Preferred supplier of

KONINKLIJKE DE VRIES SCHEEPSBOUW

FEADSHIP ROYAL DUTCH SHIPYARDS

ROYAL VAN LENT SHIPYARD

Supplier of

AKYACHT

PALUMBO SUPERYACHTS

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