

ROYAL HAKVOORT
When the Stars Align

HOW TO BUILD IT

The technical magazine for those involved in the design, construction and refit of superyachts

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When the Stars Align

Project YB256 is a 45-metre steel and aluminium motor yacht under construction at Royal Hakvoort Shipyard in the Netherlands. The first collaboration between the family-run yard and Hoek Design Naval Architects, the yacht's retro styling masks a modern and highly capable cruiser engineered for long-distance voyaging.

JUSTIN RATCLIFFE

GUY FLEURY

“The hull and superstructure were conceived to balance classic proportions with today’s efficient hydrodynamics.”

The impossibly picturesque village of Monnickendam on the western shore of the Markermeer, a vast freshwater reservoir not far from Amsterdam, has been home to the Royal Hakvoort Shipyard for more than a century. Wedged into a narrow strip of dockland between the old town centre and the water’s edge, space is as precious as the custom yachts it builds, but over the years the management has perfected a choreography of space and timing to ensure multiple projects can progress without tripping over one another.

“Hoek Design is just a few kilometres down the road and we’ve often wanted to work with them, but the stars never aligned,” affirms Klaas Hakvoort, fourth generation director of the shipyard with his brother Albert Jr. “In this case, the client wanted Dutch pedigree, was happy with our pricing, and the complexity of the project was a perfect match for a custom builder like us.”

Project YB256 was inspired by Blue II, the 56-metre expedition vessel with classic lines by Hoek Design launched by Turquoise Yachts in 2020. Hoek Design partners Andre Hoek and Ruurt Meulemans translated the client’s admiration for the retro-influenced yacht into a more compact platform that would echo the same timeless elegance free of nostalgic mimicry, while embracing modern technology and efficiency. The owner’s exacting brief included full wheelchair accessibility, an elevator connecting all deck levels, and transatlantic capability.

“The hull and superstructure were conceived to balance classic proportions with today’s



Klaas Hakvoort

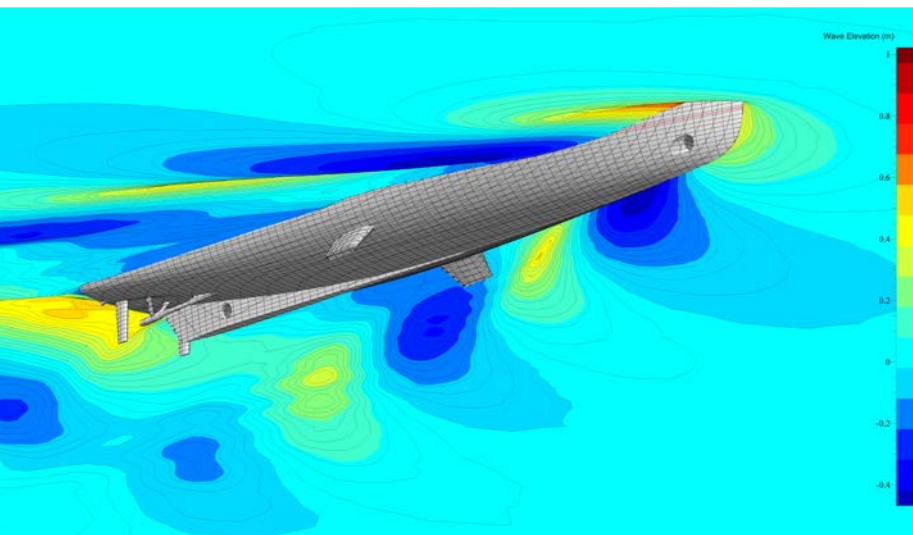
Ruurt Meulemans

J. RATCLIFFE



Bottom: A render of the retro-styled motor cruiser in build at Royal Hakvoort.

Below: A CFD study of the hull designed for long-range cruising.



efficient hydrodynamics,” says Ruurt Meulemans. “Computational fluid dynamics [CFD] analysis informed every curve, refining the bow shape and optimising volume distribution to reduce resistance as much as possible and improve wake flow to the twin propellers. The objective was a smooth, efficient ride across a transatlantic cruising envelope of close to 4,000 nautical miles – no small achievement for a vessel under 400 gross tons.”

Meeting these requirements called for some clever engineering based on robust, proven solutions. Finite element analysis (FEA) guided the placement of bulkheads, stringers, and the keel to ensure structural integrity under long passages without compromising interior volume. The challenge was compounded by hybrid-assisted propulsion comprising twin 1,000-hp MAN diesel engines paired with electric motors and supported by a lithium-ion battery bank.

The system integrated by Eekels Technology allows for flexible operational modes.

Electric mode provides a few hours of silent propulsion at low speed, ideal for manoeuvring in harbours or environmentally sensitive zones. In diesel mode the electric motors can function as shaft generators to reduce fuel burn on extended passages. The electric motors also add redundancy for additional peace of mind far from home. Royal Hakvoort had direct experience of the latter: during sea trials of 61-metre Asia, an electrical fault caused an engine shutdown, but the gearbox-mounted e-motors allowed the crew to manoeuvre safely away from an offshore wind farm. »

“By the time everything is installed, the engine room will be very full, but accessible and maintainable. Not cluttered – engineered.”

THE BATTLE FOR SPACE

A signature feature of the yacht is the continuous ribbon of wraparound glazing on the main and bridge decks – 17 tonnes of it. The bulwarks are also glass and the hull windows incorporate a dot-fade pattern that blends with the white hull from a distance. Combined with the classic sheer line and bronze-metallic funnel, the green-tinted glass adds a touch of understated elegance that hints at an era that never quite existed – but should have. The wheelhouse windows are not full-height, but the aluminium surfaces beneath will be clad with glass and the same green reflective finish to create the visual effect of uninterrupted glass.

Extensive glazing has a downside, however: heat. Solar load becomes a critical issue, especially for a yacht destined for hot climates. One option is to increase HVAC capacity, but a smarter one is to engineer better insulation. Hakvoort chose the latter. A two-year development programme with glass specialist Royal-Maritiem sought the ideal balance of solar control, privacy, clarity, structural strength, and colour uniformity. Each double-glazed laminated pane is filled with argon gas and coated with a low-emissivity metal film tuned to deliver the desired green tint. The result is a 50 percent reduction in heat transfer compared to conventional marine glass.

But heat is not the only issue. Full-height windows also eliminate the storage units and hidden cavities normally used to route ducting, wiring, and AC trunking, pushing the technical infrastructure inward. As a result, space became the defining constraint and the build team had to fight for every cubic centimetre. Hoek Design has deep experience of designing sailboats where space is always at a premium, but it was up to the shipyard to find ways to integrate complex systems into tight envelopes.

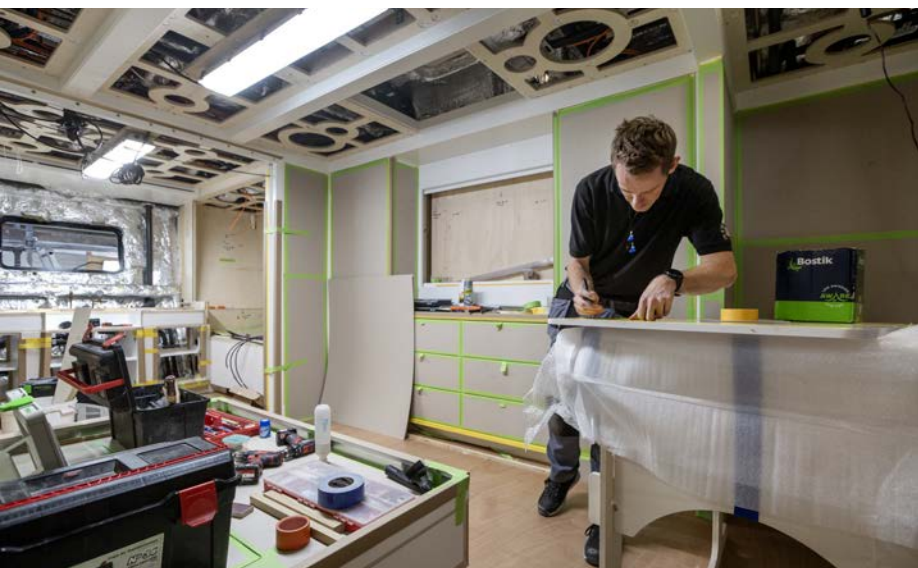
“Nothing fitted, so we had to make it fit,” says Klaas, which could be the unofficial motto of the project. “By the time everything is installed, the engine room will be very full, but accessible and maintainable. Not cluttered – engineered.”

The electrical switchboards span the full height of the engine from port to starboard across, an unavoidable result of the hybrid system. The engine room itself relies on seawater-fed heat exchangers because there wasn't room for conventional air-cooling systems. The pool doubles as a tender bay with a dump tank and its own dedicated crane compartment that closes flush with the teak deck. Under the sunbed on the foredeck is a two-storey garage for the crew tender and a pair of PWCs. Add the elevator, wider side decks and interior passages sized for wheelchair access, and every available every void had to serve a purpose. »



J. RATCLIFFE (3)

Left, from top: The engine room is compact but not cluttered; outfitting of the interior begins; the aluminium side-boarding platform.



THE SHIPYARD

Royal Hakvoort traces its origins to 1919, when Albert Hakvoort Sr. began building wooden fishing boats. After the Second World War, the yard transitioned to steel construction, eventually shifting toward luxury yachts in the 1980s when the US owner of a Striker sportfisher came seeking a new yacht. The yard has remained fiercely independent through four generations and received the prized “Royal” warrant in 2020, recognising its reputation for high-quality custom superyachts.

Key projects include 61-metre *Asia*, 64-metre *Scout*, and 49-metre *Mirgab VI*. Alongside YB256, a 65-metre yacht (YN254) is also under construction, nearly filling the 66-metre shed. With a new 70-metre project signed – its largest to date – Klaas laughingly admits that “something will stick out a bit!” Expansion landward is impossible, and waterside space is already maximised. When necessary, however, the yard is permitted temporary extensions resting on a reinforced slipway that was rebuilt in 2010 to support larger superyachts.



GUY FLEURY



Project YB256 - SHORT SPECS

Length overall	45m
Max beam	8.30m
Draft	2.55m
Gross tonnage	approx. 380GT
Hybrid propulsion	x2 MAN diesel engines (735 kW); x2 electric motors (127 kW); EST Floatech lithium-ion battery bank (520 kWh)
Naval architecture	Hoek Design Naval Architects
Exterior design	Hoek Design Naval Architects
Interior design	Hoek Design / Liaigre
Builder	Royal Hakvoort Shipyard



GUY FLEURY

HIDDEN IN PLAIN SIGHT

The metallic bronze faux funnel is more than a charming styling cue; it also highlights the kind of engineering concealment that defines the whole project. Since the yacht has underwater exhausts, there was no need for a traditional dry stack - nor was there space to route ducting up to one. Instead, the funnel became the home of the fresh-air unit that draws in and purifies outside air for the HVAC system. Fitting it inside that tight volume meant some early design assumptions had to be reworked.

Routing the air quietly around the yacht from high up in the vessel posed further challenges. The onboard noise targets are uncompromising and the owner's suite is engineered for a harbour maximum of 44 decibels, although Hakvoort typically achieves lower. Underway, the expected levels sit in the low 50s - quiet enough that the only audible sound should be the soft splash of water along the hull. Modern superyachts achieve such low mechanical noise levels that airflow has become the primary acoustic concern, not the engines or generators.

"You won't hear machinery these days - you'll hear air moving through the ducting," confirms Klaas. "That's why we focus obsessively on silencing ducts, bends and terminations."

Consider the HVAC ducting for the crew quarters. To reach the lower deck forward, it has to pass under the bed in the owner's stateroom, negotiating several dog-leg bends in the process. Air accelerates noisily through tight turns due to mass conservation and pressure shifts, so the yard routinely uses flexible elbow sections with larger diameters and internal damping to reduce turbulence and suppress sound. »





Clockwise from bottom:
 Note the insulated, flexible sections for the HVAC ducting that passes under the owner's bed; the shipyard fabricates its own stainless steel brightwork; the wheelhouse viewed from the foredeck.



J. RATCLIFFE (3)

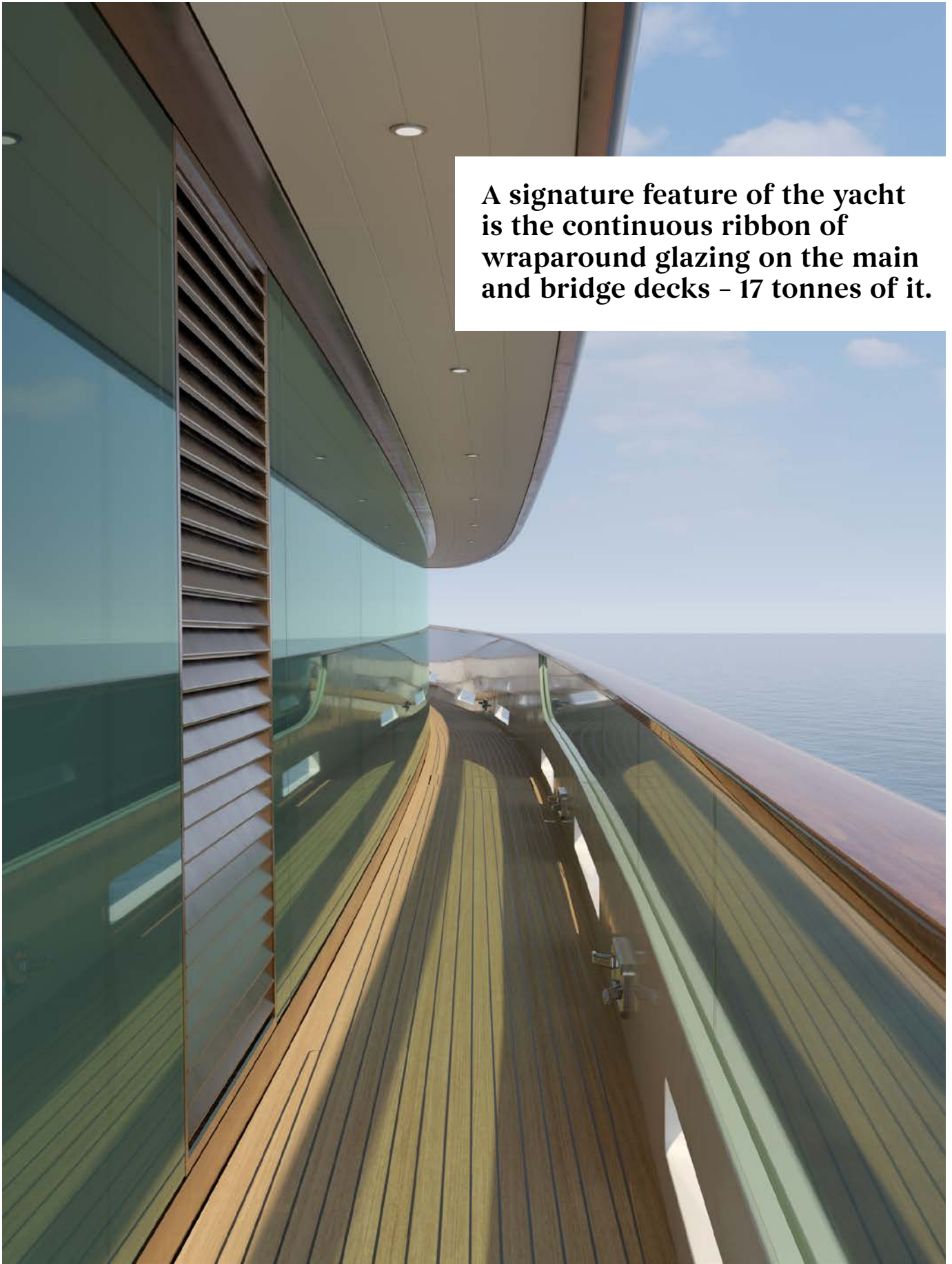


J. RATCLIFFE

THE DESIGNER

Hoek Design Naval Architects was founded in 1986 by Andre Hoek and quickly gained recognition for blending classic aesthetics with modern performance. After joining the studio as a specialist in aeronautics and hydrodynamics, Ruurt Meulemans became a managing partner in 2011 and now leads the design office.

The firm is best known for pioneering the “classic above/modern below” design approach, which integrates traditional yacht styling with modern underwater configurations like wing keels and spade rudders. Milestones include the development of its Truly Classic range in the 1990s and the launch of designs such as *Adele*, *Athos*, *Elfje*, *Wisp*, *Meraki* - all demonstrations of the “modern classic” concept. Today, the firm is applying the same design DNA to powerboats with *Blue II* and the 45-metre retro design in build at Royal Hakvoort.



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ELEGANCE WITH AN EDGE

The aluminium superstructure was built at Alubouw Fryslan in Franeker and joined to the steel hull at Buijs Shipyard - the hull builder - before being towed to Monnickendam, but Royal Hakvoort has its own joinery division and stainless-steel department that produce most of the fixed furniture and deck hardware in-house. Klaas points out the custom-engineered hinges used for the exterior doors as an example of the shipyard's hands-on approach. During development, these hinges were tested in the most practical way imaginable: by suspending 40 kg weights to a toilet door heavily used by shop-floor workers. Any weaknesses that surfaced were corrected before installation.

Another example is the aluminium hull platform that folds out from the topsides amidships and connects to the main deck by way of a boarding ladder for tender access. The platform being assembled in the metalworking department uses a hydraulic rotary or slew drive - more compact than conventional rams and able to generate high torque in tight spaces, it is a solution that has been refined by Royal Hakvoort over years of building canoe-stern vessels.

Although capable of crossing the Atlantic, YB256 will primarily be used for short, comfortable runs with the frequent returns to port and high hospitality demands typical of most operational profiles. Every aspect of the interior has been conceived with wheelchair accessibility in mind, including a transformer-style platform in the stern. Guest and crew flows remain fully separated, which is not always the case on yachts of this size.



J. RATCLIFFE

The lower deck houses two full-beam VIP suites arranged around the main lobby and elevator; a third space will be used as an office/gym with a built-in recess for a running machine. The bridge deck is reserved for the owner's sky lounge, while the captain's cabin has been relocated to the lower deck. Crew areas have been configured to maximise discretion and operational efficiency with service and storage areas scaled to support day-use cruising.

After touring the shipyard and the yacht, the lasting impression is that YB256 is not just a modern yacht in retro clothing. It is a study in constraint-driven design and smart engineering by a shipyard for whom "custom" is a vocation, not a marketing term. Its timeless elegance is more than skin deep, the result of many difficult decisions made in the belief that contemporary and classic can comfortably coexist - both in appearance and in engineering. ●

Top: Royal Hakvoort carries out most engineering works in-house.