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# DYKSTRA

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■ NAVAL ARCHITECTS ■

56M CLASSIC KETCH · ADIX AND ADELA · CLIPPER SHIPS · VICTORIOUS VELSHEDA · YANKEE · CONCEPTS



## NEWSLETTER

DYKSTRA NEWS,  
UPDATES & MORE

## 56M CLASSIC KETCH

Construction work is under way at Royal Huisman on a graceful 56m/184ft classic ketch with naval architecture and exterior styling by Dykstra Naval Architects and interior design by Mark Whiteley.

A ketch rig with generous sail area combined with a modern underwater body with fin keel and spade rudder will assure all-round performance, especially in light airs. Stowage space below deck is planned for numerous toys such as sports diving equipment, a Laser, kayaks, windsurfers and bicycles.

“The owner’s brief was for a stunning looking yacht for family enjoyment,” says Dykstra’s MD Thys Nikkels. “We designed a slender hull with long overhangs to create an elegant and classic profile with favourable sea-keeping characteristics that are ideal for worldwide cruising, but there will be times when we might also see her in a Bucket regatta or two – she will be as much at home in a secluded bay as on the race course or the high seas.”



56m ketch



Adix



Adela

## REFIT NEWS: ADIX AND ADELA

Built by Astilleros de Mallorca in 1984 to an Arthur Holgate design, at almost 65m/213ft Adix is one of the largest sailing yachts built since the 1930s. She was first refitted by the Pendennis shipyard in 1991, and again in 2001 and 2008. She returned last winter season to begin a series of modifications to improve her sailing performance, especially in light airs.

Dykstra Naval Architects was responsible for carrying out calculations to lighten the hull. This was achieved by removing some ballast and redistributing what remained to lower her centre of gravity. Following a summer spent in the Mediterranean, Adix will return to Pendennis to have

her new Southern Spars composite rig and bowsprit installed, which will provide 10 % more sail area.

Since her original restoration, 55.5m/182ft Adela has undergone further remodelling work by Pendennis. Dykstra Naval Architects is currently conducting an in-house study on how best to augment her all-round performance. With the planned increase in sail area, further studies are being made to reduce weight while maintaining stability, possibly by increasing the draught or adding trim tabs, dagger boards or centreboards. Adela is expected to return to Pendennis for the remodelling and refit work this autumn.



Meteor

## ADELA WINS IN ST. BARTHS

The 55,5m/182ft classic schooner Adela, with refit design by Dykstra Naval Architects and remodelling work by the Pendennis Shipyard, won joint first in the Elegantes des Mers class at the 2015 St. Barths Bucket. Dykstra Naval Architects would like to

wholeheartedly congratulate her owner and crew on their podium result in the iconic St Barths Bucket Regatta, of which the studio is an active sponsor.

The Dykstra-designed two-masted schooner Meteor (Royal Huisman) and J-Class Rainbow (Holland Jachtbouw) also participated in this year's

Bucket. Our Spirit of Tradition ketch Kamaxitha, the J-Class JK6 Hanuman and three-masted schooner Athena – all built by Royal Huisman – were not competing on the race course, but certainly added to the spectacle with their grace and beauty whether anchored in Gustavia or cruising offshore.



Rainbow



Adela

## CLIPPER SHIPS: BACK TO THE FUTURE

Dykstra Naval Architects are specialists in the design of square-rigged sailing ships and have launched three such vessels to date in collaboration with Damen Shipyards: Stad Amsterdam, Cisne Branco and Shabab Oman II. The Stad Amsterdam is a three-masted clipper that was modelled on the mid-19th century frigate Amsterdam. She was built in 2000 (this September marks the 15th anniversary of her launch) as a passenger vessel that also hosts corporate events with the aim of integrating the classic qualities of the historic clippers with modern building techniques and amenities. With 12 deckhands working the SOLAS-certified ship, she can sail at 15 knots and won the Cutty Sark Tall Ships Race immediately after her launch. In 2009 she was refitted to accommodate a TV crew retracing the second voyage of Darwin's HMS Beagle for Dutch television.

When the Stad Amsterdam was still in the design stage, Dykstra Naval Architects also received a commission to design a sister ship for the Brazilian Navy. The Cisne Branco was launched in 1999 and made her maiden voyage across the Atlantic Ocean in time to celebrate the 500th anniversary of the discovery of Brazil by the Portuguese Admiral Pedro Álvares Cabral. She serves as a sail-training vessel for the cadets of the Brazilian Naval School and Merchant Marine Academy.

The most recent square-rigger to be delivered is the 87m Shabab Oman II in 2014 for the Royal Navy of Oman. "The Royal Navy of Oman fell in love with the Stad Amsterdam and they came to our office to discuss a sister ship to replace the smaller Shabab Oman I," says Thomas van Es, a Dykstra naval architect who has served aboard several traditional sailing ships, including the schooners Wylde Swan and Noorderlicht, and the Stad Amsterdam. "She started as a copy, but the final design was for a larger and more slender vessel that is also very high end to represent the country as an ambassador not just for their navy, but also their culture."

The studio continues to receive enquiries for such vessels from commercial organisations and private individuals. The former is generally interested in the clipper concept to create a fleet of luxury cruise ships, whereas the latter focus more on incorporating modern, lightweight materials and equipment such as high-speed winches and furlers to be able to sail with a reduced crew. Proposals over the last few years have included a number of projects from a 25m two-masted brigantine to a four-masted barque of over 100m.



Shabab Oman



Stad Amsterdam





Velsheda

## VICTORIOUS VELSHEDA

*Dykstra Naval Architects has over 25 years of experience designing rebuilds or creating plans for the remodelling and refitting of no fewer than seven J Class yachts: Rainbow, Endeavour, Hanuman, Shamrock V, Ranger, Velsheda and Yankee.*

To keep the J Class fleet and races alive and to encourage new build yachts to enter the field, the J Class Association maximum performance rules were developed by Dykstra Naval Architects and the Wolfson Unit in Southampton. Based on a VPP

(Velocity Prediction Program) rating system, the rules put limits on the performance with the aim of bringing fair and close racing to the fleet and to give all designs a chance of winning on handicap. Over the years the Dykstra team has gained an enormous amount of hands-on information by racing on all the Js in the current fleet.

Earlier this summer, three Js – Velsheda, Lionheart and Ranger – took part in the Bicentenary International Regatta organised by the Royal Yacht Squadron in Cowes. Velsheda was sailed impeccably to win all four races and maintain her outstanding record on what are considered the famous yacht's 'home waters'. In fact, she was already unbeatable

mathematically going into the final race that was marked by light airs with little more than the tidal current to carry the yachts across the finish line. Behind Velsheda in the overall results came Lionheart in second place and Ranger a close third.

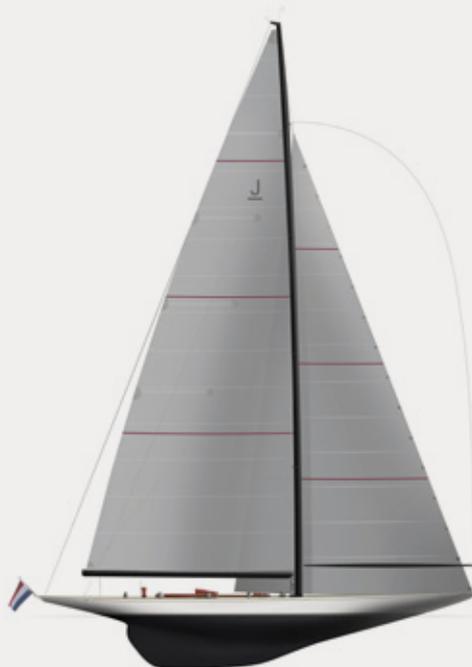
For the owner of Velsheda and her race crew, led by tactician Tom Dodson, the decisive victory built on their success when the J Class last visited Cowes three years ago. "This is where the Js heritage is, Velsheda's home, and so it is very special indeed to win here," said the owner. Dykstra Naval Architects warmly congratulates the owner and his crew on their convincing performance.

## YANKEE

With news that the J Class will return to race in the America's Cup in a parallel regatta in 2017, we present designs for a replica of Yankee, the J Class yacht that took part in the round robin series to defend the America's Cup in 1930.

The original Yankee was designed by Frank Paine with an almost straight sheerline and easy lines. Dykstra Naval Architects has retained the same clean design and flush deck layout and focused their efforts on optimising performance within the new JCA rating system using their own VPP programs and CFD and FEM analyses derived from over 30 years' experience in rebuilding, refitting and building new replicas of seven J Class yachts.

"These boats were designed to race and that is the idea behind the new Yankee," says designer Jeroen de Vos, who has sailed on seven of the eight Js launched to date. "Our experience of sailing on very different boats has taught us that bigger is not necessarily better. It's all about waterline length, not length overall. So rather like Rainbow or



J Class Yankee

Endeavour, the new Yankee will be quite small and light and very nimble."

Predicted performance gains are not always directly comparable with gains on the water, and herein lies another important lesson that the Dykstra team has learnt through hands-on experience: the importance of keeping the deck layout as simple and efficient as possible. "We've seen that it's crews that win races," explains Jeroen de Vos. "If you mess up the start, the race is almost over before it's begun, so the crew has to be able to handle the sails and deck gear quickly and easily."

HJB has exclusive ownership of the rights to build the Yankee designs, which is now ready to begin construction. The original Yankee was a powerful contender for defender in 1930, but she was not as fine-tuned as her rivals. She took part in the 1934 America's Cup trials with modifications to her rig and bow and proved much more competitive. Following the latest optimization study by Dykstra Naval Architects, no doubt she would prove even swifter on the water.



Thys Nikkels

## THYS NIKKELS DYKSTRA NAVAL ARCHITECTS' MANAGING DIRECTOR

*Thys Nikkels joined Dykstra Naval Architects fresh from college in 1991. Seven years later and with retirement in mind, Gerard Dykstra invited the young naval architect to become a partner with a view to taking over the firm. That process was completed in 2004 when Thys became sole owner of the studio.*

### Is Gerard involved at all in the company today?

I acquired the office in 2004 and since then it has been completely my responsibility. Gerard likes to get involved in the odd project, although increasingly less so now. He spends a lot of his time aboard his aluminium sailing boat Bestevaer and occasionally steals a staff member as crew! Actually, it's the best training school you can have, so I encourage it.

### How has the business changed since you started out in the early '90s?

It's changed a lot. When I started we had two projects on the books: the refit of 65m Jessica that became Adix, and the ketch Sensation.

The boats have got bigger over the years. We thought 60m Stad Amsterdam was the biggest we would see 15 years ago, but then Athena and Maltese Falcon came along and now the 106m Project Solar in build at Oceanco. We've had to grow the company in the meantime and today we have a staff of 10.

### How do you go about designing a boat for a client who perhaps doesn't know much about sailing?

It can be tricky. You have to balance what the owner might want to do with his boat with what he can do. It's not just about pure sailing; there's also the lifestyle aspect, crew considerations, and the fact that these big boats sometimes spend a lot of time motoring. So part of our job is also about educating our clients and managing their expectations.

**In terms of raising brand awareness, how important was The Maltese Falcon launched by Perini Navi in 2006?**

It was very important, both in terms of attracting clients for big boats and because we enjoy a challenge. We like to investigate and research new technologies or materials, and make a conscious effort not to repeat what has come before. Designing these yachts is hugely complex as they require managing the massive loads involved, the consequent handling and safety factors, and optimising the whole naval architecture. The Maltese Falcon and the three-masted gaff rigged schooner Athena built by Royal Huisman really put us on the map for a different kind of client.

### To what extent are you involved in each individual project?

I'm involved in all of them, which is the main reason why we don't want to grow the company any further. The extent of that involvement depends on the project. On some we have more contact with the owner's representative or project manager, and in those cases I'm happy to delegate. Other times the client expects to deal directly with me as the studio principal.

I think it's important also to be able to spend time with the clients on their boats, because that's what it's all about at the end of the day. We do this a lot on the J-Class yachts we've designed and one or two guys in the office are regular crew. This is something I'm trying to do more of, but getting out of the office is sometimes easier said than done!



111 ft Plumb bow

## CONCEPT UPDATE

An informal discussion about trends in the market for large sailboats between Will Bishop of YPI and Jeroen de Vos of Dykstra Naval Architects has led to a concept for a 34m/111ft sloop with plumb bow. The new concept being developed in conjunction with composite specialists McCornaghy Yachts in Australia.

The brief for the new racer-cruiser concept was that it should have a plumb bow with counter stern for traditional looks that nonetheless reflect a racing pedigree, be easy to sail with a small crew, be free of unnecessary gadgets, and have generous exterior social areas and cockpit. It also clearly detailed the requirement for ample guest accommodation that could meet the demands of larger parties or charters.



102 ft sloop

A related but more extreme concept is for a 31m /102ft sloop, conceived as a pure racer. Dykstra Naval Architects has a long history of designing yachts with plumb bows, most recently Hetairos and Kamixitha, which set a trend for ketch-rigged plumb bows. The 31m sloop currently in development is in response to a request for a radical Bucket racer with classic looks. Cruising is not on the agenda. In fact, the very light displacement boat would be constructed entirely of advanced carbon composites and the stripped down interior, consisting of just a couple of heads, a galley, an aft owner's cabin, and little else.

## RESEARCH & DEVELOPMENT

*R&D has been a vital element of Dykstra Naval Architects ever since the studio was founded over 45 years ago. To some extent this research is also driven by the needs of the commercial sector, as in the case of the proprietary routing software designed for motorsailers to optimise fuel consumption while under sail, which was initially developed for vessels such as Rainbow Warrior III and the Wasp (former Ecoliner) concept for a four-masted cargo ship carrying a Dynarig.*

A more recent research program is looking into the potential applications of so-called 'topology optimisation' in yacht design and construction. Topology optimisation is a mathematical approach that optimises material use within a given design space for a given set of loads and boundary conditions, such that the resulting layout meets a prescribed set of performance targets. It is a method by which designers and engineers can find the best concept design that meets the design requirements, which is then fine-tuned for performance and manufacturability.

The springboard for this research was the 46m EXO sloop concept developed in partnership with Claydon Reeves. The designers introduced a more organic and natural approach to this project inspired by shapes and forms not usually found in traditional yacht design with its linear form language. This, in turn, led to a study in conjunction with the Alfred Wegener Institute in Germany that took Nature as the source of inspiration. The study analysed the exoskeletons of microscopic marine creatures to discover whether the

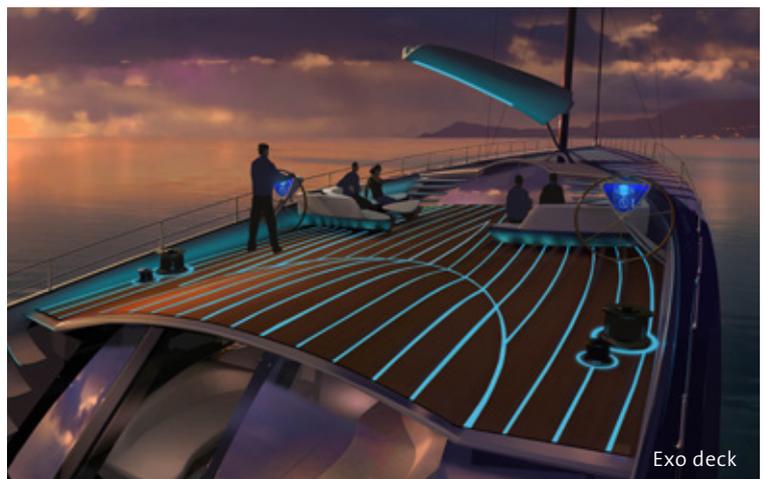
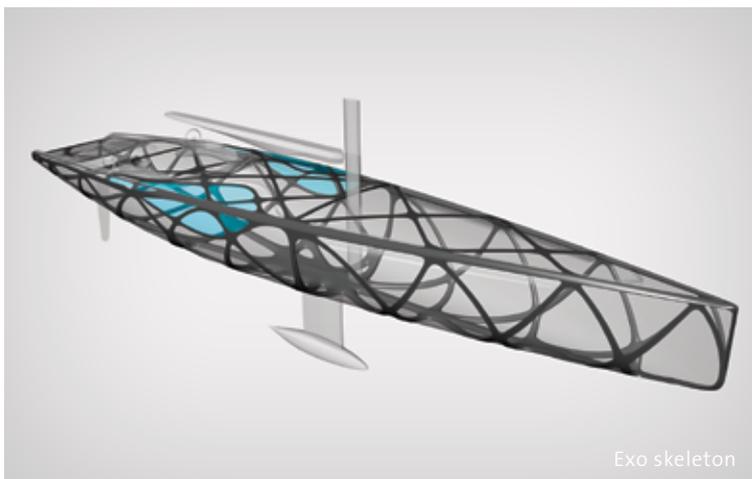
same functionality, efficiency and aesthetics could be transferred to yacht design using a dedicated software program.

The basis of any optimisation is the definition of a specification with information on the materials, the manufacturing process, the restraints and the loads. Optimisation variables such as weight, maximum stress or displacement are also defined. In some cases a topology optimisation can already give first clues for an intelligent positioning of the material, so that 'superfluous' material can be eliminated. The principles of the archetypes are translated into technical component designs with the aim of simplifying the geometry while retaining its functionality.

In the case of the composite EXO concept, this involved entering data on load paths through components such as the fore- and backstays, shrouds and keel box, into the software program. The resulting 3D 'skeleton' design basically mirrors the loading on structural stiffeners and truss members in the hull, as well as the deck and bulkheads.

"Because the spaces in between the load paths are non-structural, you can then create shapes in the hull that would not be possible with traditional frame construction," says Thys Nikkels. "In the case of EXO, for example, the large organic windows set into the hull are the direct result of this process insofar as they are designed around the loads on the hull structure, not the other way around."

The research is still in its infancy, but in theory an 'organic' composite structure could be manufactured in a female mould that is then clad to create the hull form.



## A WORD FROM GERARD DYKSTRA ABOARD S/Y BESTEVAER2

For many years I have been working together with the guys in the office, or vice-versa, towards developing and designing sailing yachts. This has involved a close working relationship. Both parties obviously have a bond with the sea, yachts and sailing, but in comparison with many of the guys in the office my academic background is not that well developed. However, my practical experience at sea is very strong, which is not always the case with the new generation in the office. Of course, I have had many more years on the water and this is why I like to invite the guys to sail with me and my wife, Loon, aboard Bestevaer2. It means we can sleep peacefully when not on watch, while the youngsters can take care of the issues on deck during their watch and gain practical experience. It is always a pleasure to sail with them, not only for the company, but also to discuss at sea the important issues of practical yacht design. And what

better place to do so? Being able to perform the most intricate calculations is not sufficient if you do not have direct experience of an angry sea. Hence, I am happy to be able to contribute to this aspect of their careers and even more glad to feel I am making a practical contribution.

Bestevaer2 has sailed to Falmouth many times, to Greenland, to the Bartenszee and Russia, and recently to Nova Scotia with a full DNA crew. It has always been a happy boat and all on board learned from each other. It might have been about the ergonomics of a proper galley design or the beneficial effects of water ballast for cruising, the handling of the sails or how best to improve performance or the boat's behaviour in a seaway. But above all it is the pleasure of having two generations of yachtsmen sailing in harmony. And long may it continue.

**GERARD AND LOON DYKSTRA**



### ABOUT DYKSTRA NAVAL ARCHITECTS

## OUR DNA

Dykstra Naval Architects brings over 40 years of experience in the design, redesign, naval architecture and marine engineering of classic and modern performance yachts and offers preliminary and concept designs for both pleasure and commercially operated yachts. Founded in 1969 by Gerard Dykstra, and led now by Managing Director Thys Nikkels, the award winning team at Dykstra is comprised of passionate sailors actively sailing our own designs and redesigns using first hand practical experience combined with in-house developed software to provide expertise in spars, rigs, and structural analysis that is current, tested and tried.

Photo onboard Gerard Dykstra's "Bestevaer II"

From left to right: Jeroen de Vos Naval Architect, Edwin Luijff Naval Architect, Thys Nikkels Managing Director and Naval Architect, Erik Wassen Naval Architect, Loon Dykstra (sitting on boom) Accounts, Anneliek van der Linde Public Relations and Marketing, Mark Leslie-Miller Naval Architect, Thomas van Es Naval Architect, Hilbert ten Have Naval Architect, Gerard Dykstra Company Founder and Naval Architect

