All the performance with a bit more comfort

A new semi-custom racer from Judel/Vrolijk and Oceantec takes the Class40 concept back to its roots… with an extensively optimised IRC rating and a super-lightweight interior

Class40 has moved on from its initial concept. What started as a class offering short-handed offshore racing for top-tier amateur sailors on moderate budgets has morphed into a very successful class of completely stripped-out racing machines, campaigned with serious money, whose primary function is to provide a stepping stone for professional solo sailors en route to rock star status in Imoca 60s. So where do you go if you want a boat that truly reflects the original spirit of Class40, with the same level of performance as the top boats in that fleet, but also a competitive IRC rating plus the bare minimum of accommodation for weekend cruising with family and friends? Two experienced Class40 racers couldn't find anything quite like that so they asked judel/Vrolijk to design it for them.

Is there really a gap in the market? There are plenty of options aimed at sailors who want a high-performance boat but they all assume that the buyer expects a high standard of luxury. Exotic materials like Nomex and prepreg carbon partially defray the weight of a posh interior but that sort of boat inevitably ends up being complex, loaded with sophisticated systems – yet still unable to match the boatspeed of a far simpler Class40 built in foam-cored fibreglass. And that, in essence, is the rationale behind the new j/v43.

'The clients approached us because they knew we were already looking at this kind of concept,' says Antoine Cardin of

Built around the engine box and on top of the hull's structures, the total weight of the interior – seat, bunks, table, galley, heads, fairing, paint and everything else – is only 150-200kg. Its impact on performance is minimal

Judel/Vrolijk, the lead naval architect on the project. Cardin's own personal experience was a good fit, notably his optimisation work on the HH42 *Ino XXX* (ex-*Oystercatcher 30*) which kept that nine-year-old production boat at the top of the IRC fleet for four consecutive years, with its offshore performance improving steadily every season (see Seahorse November 2021 issue).

'We were very focused on *Ino* and we were looking closely at Class40s,' Cardin says. 'We had in mind that there was a definite niche where you could combine those two concepts and make a very competitive IRC boat for all-round offshore racing. We started with *Ino* as a base line, compared it with a Class40 concept and studied the strengths and weaknesses of both directions.'

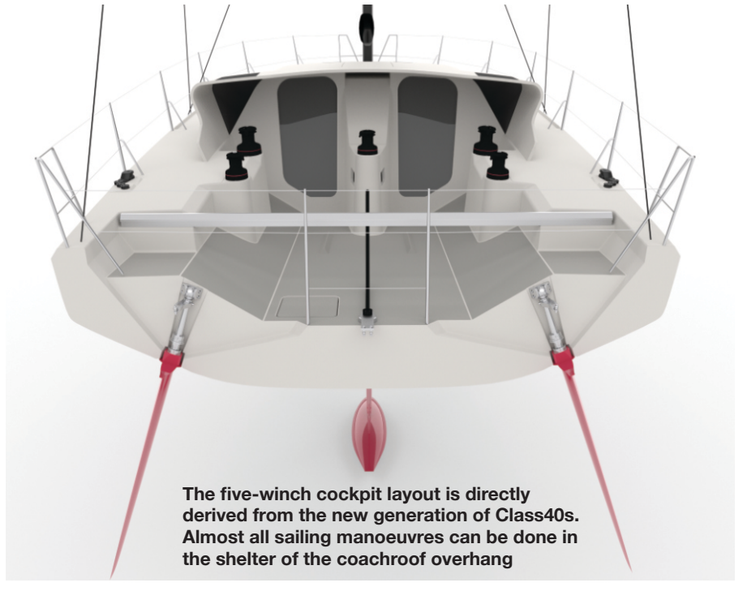
'The j/v43 is very similar to a Class40 in terms of how it's built and the materials,' Cardin explains. 'We stretched the boat to give the clients more interior space. We used what we learned from *Ino* in terms of appendage design and sail configuration for IRC optimisation. The major difference is that Class40s are not optimised for IRC; that involves different design features, especially for the sailplan. In Class40 they can do pretty much what they want, they can use types of headsail that just don't work for IRC. So the sailplan for the j/v43 is an evolution of the *Ino* learning process: flying headsail, inner staysail and so on.'

The operational use of the j/v43, which set the design parameters for the project, is more broadly based than a typical Class40. Transatlantic races will be part of the mix, along with classic 600-mile events such as the Fastnet and the Middle Sea Race, and perhaps some Caribbean regattas, but the primary focus will be long-distance short-handed racing in the Baltic with two to four crew on board. Inshore racing doesn't figure in the design brief.

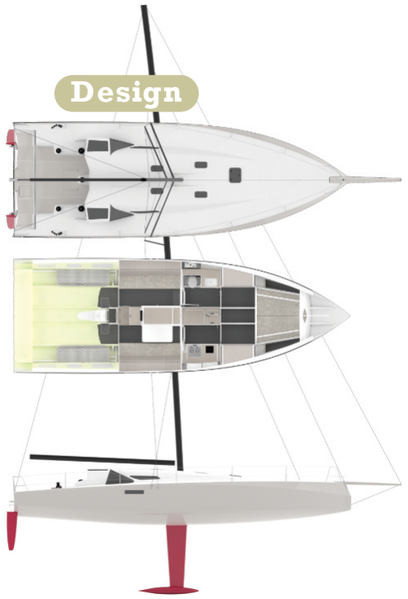
'We learned in CFD that a hollow in the underbody can work very well offshore'

The first step in the design process was to decide on a scow-type hull. 'From there we developed eight new hull shapes with variations in features like chines, flare and maximum beam,' Cardin says. 'We ran some trials to pick up the right sort of hull geometry and then presented the results to the clients. It's not as extreme as a Class40 because we still have a bit of upwind consideration in this concept and with a longer waterline the motion will be easier in waves.'

Proprietary software played a key role. 'We have been developing our own CFD RANS code to improve the quality of our results,' Cardin explains. 'We can run any geometry we want, at any speed; we have a powerful computing cluster in house so ▷



The five-winch cockpit layout is directly derived from the new generation of Class40s. Almost all sailing manoeuvres can be done in the shelter of the coachroof overhang



The design was commissioned by two experienced Class40 racers. It's a development of 15 models

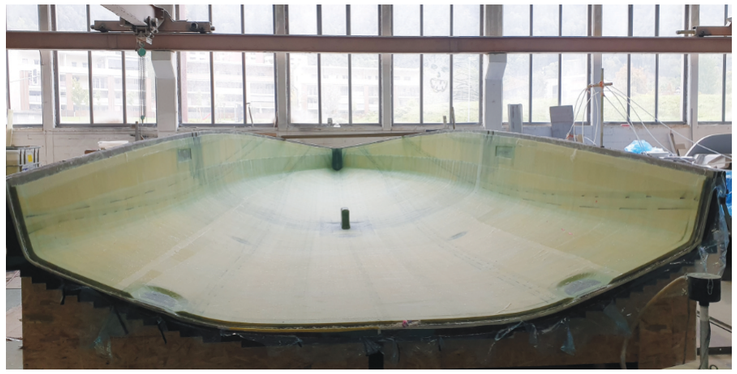
Antoine Cardin, naval architect, Judel/Vrolijk

The JV43 is designed to push the limit in offshore sailing for a wide range of client profiles. Using the latest developments in open sea performance and handling, the solution is very similar to a Class40 concept with a longer hull to better accommodate the necessary interior and equipment. The hull shape solution is a development from 15 comparison models, all analysed using our latest RANS Code CFD tool.

The deck layout is optimised for a short-handed crew and offers multiple seating positions and protection. The cockpit is designed around two entry doors and a central pit console, resulting in a five-winch arrangement. All lines and halyards are run back into the cockpit area so that nearly all manoeuvres are possible inside a protected space.

Above deck, the rig and sailplan are optimised for offshore operation and for the IRC rating system. The aim is to reduce all possible performance gaps with the use of flying reaching sails and staysails. That setup helps to improve the boat's behaviour in heavy sea state conditions, to keep it balanced and to reduce nose-diving.

For better control and safety, the boat is equipped with lifting twin rudders. The keel is made out of high-strength steel with composite fairing, connected to a lead bulb at 3.0m draught. The use of 750L water ballast divided in 3 tanks on each side allows greater performance and weight reduction for the concept. The water ballast is operated from the cockpit.



The build by Oceantec in Slovenia is a three-stage vacuum infusion of e-glass and Corecell foam sandwich composite – like the Class40s they've previously made

we have complete control of what we do.' In accordance with the clients' racing plans the primary focus of CFD analysis was on planing conditions with wind speeds of 12kts-plus.

'We learned in CFD that creating a hollow in the underbody can work pretty well offshore,' Cardin says. 'That's a feature you might see more of in the future. At some specific heel angles and at a certain speed the hollow creates a longer effective waterline length which makes the hull more efficient.'

'The primary focus is long-distance shorthanded racing'

The aero package was also designed in house. 'We knew from *Ino* what types of sails we wanted to use,' Cardin says. 'At a later stage of the project the sailmaker came in to fine tune the mid-girth, the sail area and the design of the sails within our rig geometry. We developed this again with our own sail model and validated the ratio of where we wanted the boat to be placed within the fleet. Compared with a typical Class40 the SA:D is slightly higher. The appendage draught is the same, the mast is a bit taller. But it was important for us to stay close enough to the Class40 parameters so that the spar-maker can use the same tooling and we can use the same hardware.'

The deck plan and cockpit design are directly derived from the latest generation of Class40s, but with more space available three different positions are provided for the crew to sit and work. The five winches can all be operated in complete shelter, under the coachroof with good views forward and upwards for keeping watch and trimming the sails. There's a secondary position for winching and trimming further aft with a view over the coachroof and a third, fully open position for hand steering. 'The clients were very involved and had a lot of ideas,' Cardin says. 'The final layout is number nine in terms of hardware positioning and geometry.'

Oceantec, based in Slovenia, was selected at an early stage to build the two boats. 'This project is about value for money as well as performance and they are very good at delivering both,' Rolf Vrolijk explains.

'A boat that truly reflects the original spirit of Class40'

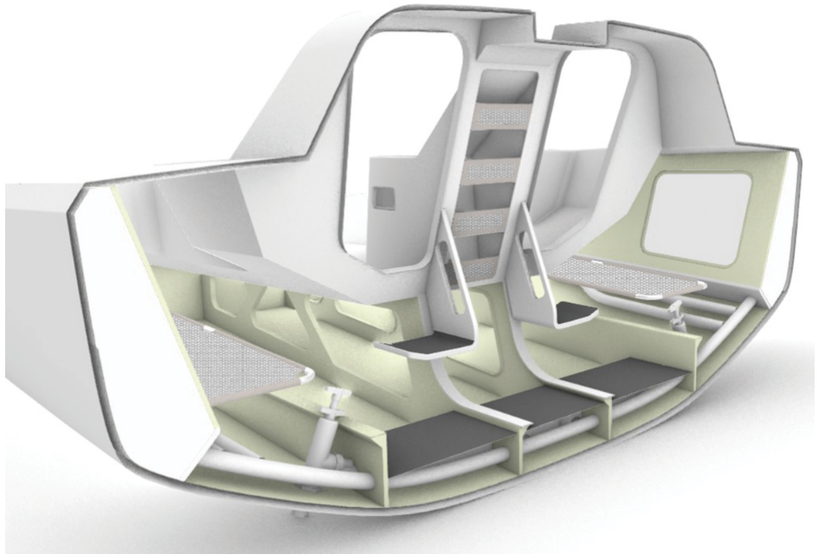
'The clients were comfortable with Oceantec from the beginning,' Cardin says. 'They knew the yard had already built some good Class40s and other similar projects; they've always been a performance oriented shipyard so we knew that they can build strong and light, matching our specifications.'

'One of the benchmarks for choosing us was the success of the NMD43 *Albator* which we launched a few years ago,' Oceantec' s Luka Kepec explains. 'That boat has had great success racing in various parts of the world. They were also very interested in our Class40 projects, especially *Vaquita*.'

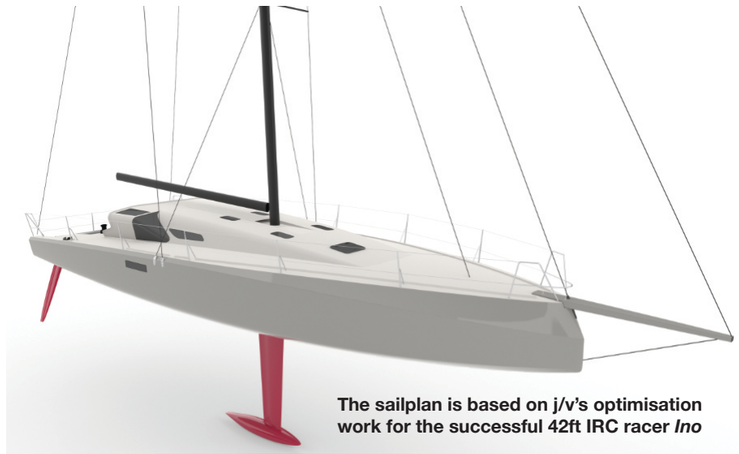
So how much heavier is the j/v43 than a Class40? The entire weight of the interior – seat, bunks, table, galley, heads, fairing, paint and everything else – is about 150-200kg right on top of the keel, so the differences in displacement and weight distribution are minimal.

The first j/v43 is due to launch in June and will make its racing début this season. Number two will launch in September and a third could be delivered with a nine-month build time. 'The mould is available and this concept will probably fit quite a lot of people,' Vrolijk says. 'It would be easy for someone to jump in and benefit from all the development work – and the yard is very flexible in adapting to a client's wishes.'

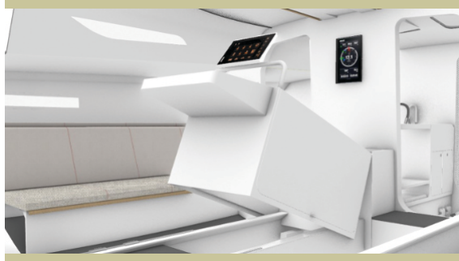
www.judel-vrolijk.com ❑



The double companionway improves ergonomics for the crew in heavy weather



The sailplan is based on j/v's optimisation work for the successful 42ft IRC racer *Ino*



The nav station and saloon table are built on the engine box. The whole thing hinges up for access

Margo Vrolijk, designer, Judel/Vrolijk

The interior concept allows the boat to be used for racing/professional sailing but also as a fun boat with family and friends, with a separate owner's cabin. The double entrance allows safe movement in heavy conditions and a clear flow of movement around the boat. The living area is designed around the engine box which serves as dining table and navigational area. The engine box is easily accessible by lifting the complete unit up. To allow better movement around the table while the navigation space in not in use, we have put the seat on tracks fixed on the structure, moving forward and aft.

Because of the great width of the boat we had the opportunity of placing large, foldable seating bunks in the saloon that can be used for additional sleeping or storage. Moving forward, we have an open galley equipped with cooking stove and removable coolbox plus additional storage. The forward compartment is the owner's cabin which can be completely closed for privacy and separate from the rest of the interior. It has a big volume of storage where we have calculated, on owner's request, enough space underneath for A3 sail stowage.

To keep weight to a minimum we have used simple materials and easily removable objects like cushions, coolbox, cooker, etc. Most of the surfaces have been painted and performance fabric has been applied for all soft details. All doors for cabinets or cabins and shelving are out of mesh fabric and closable with zippers as well as the storage in forward cabin. To create a better atmosphere, details in wood veneer have been placed and warm grey/beige fabrics have been used, together with hidden LED remote-controlled lighting throughout the boat.