

# QuantBoats Switzerland in cooperation with Dynamic Stability Systems breaks new ground - again

October 2015/aem



HIGH PERFORMANCE BOATS  
FOR AMATEURS



What ever you are aiming for  
the new Quant23 provides the fun of sportsboat-sailing  
and the thrill of foiling in one boat!



# QuantBoats Switzerland in cooperation with Dynamic Stability Systems breaks new ground - again

**We are extremely pleased to unveil the Quant23, which after its first preliminary sea trials in Cowes and in Switzerland has proven itself to be one of its first – if not THE first – fully foiling keel boat.**

## **What is Dynamic Stability Systems (DSS)?**

Designer Hugh Welbourn has spent more than 10 years developing the patented DSS, which comprises a retractable hydrofoil that is deployed to leeward on a yacht. The foil provides vertical lift to leeward, improving the yacht's righting moment, an effect similar to having extra crew on the weather rail or a bigger keel bulb, and in turn dramatically increases performance. DSS foils feature on a wide range of racing yachts such as multiple Rolex Sydney Hobart winner, Wild Oats XI, to the high performance Infiniti range of racers and cruiser racers to sportsboats, Minis plus all manner of craft between.

However the very latest DSS foils not only provide righting moment, but extra vertical lift beneath the boat too, which, in combination with a T-foil rudder, enables the Quant23 to sail fully airborne.

**The Quant23 is the first yacht to have the new foils fitted** and is the latest in the range of DSS-equipped sports boats designed by Hugh Welbourn for QuantBoats, following on from the Swiss company's Quant28 and Quant30.

## **QuantBoats' Michael Aepli explains:**

"Today QuantBoats' team is the most experienced in DSS-equipped boats. Having spent many hours sailing a DSS boat, there are lots of other positive side aspects DSS delivers, some of which made me dream of other possibilities for it, such as flying. Those who have sailed the Quant28 could feel that the boat came close, although this wasn't what it was designed to do. 'Flying' was of course further inspired by the 2013 America's Cup."

**June 2015 in Cowes (UK):** Aepli and Welbourn's expectations were fulfilled when daylight appeared beneath the hull on the very first day of sailing the newly launched Quant23.

While the Quant23 is a foiler (albeit with a fixed keel), Welbourn is at pains to point out *that she is otherwise fundamentally different to a Moth, a Flying Phantom or an AC catamaran*. While those are grand prix racers, demanding athleticism, great skill and technique to sail, the new boat does not: *"The idea is simply a boat that anyone half way experienced can leap into and ten minutes later they're flying."*

**Aepli confirms this:** "With the Quant23 the aim was not to create the world's fastest foiler, but one of the easiest crafts to fly steadily, providing fun, fast rides, in a wide range of conditions. For us this means, that the boat shall do 90% of the work and not the crew – mostly this seems to be the other way round with many of the other foiling boats of today, with complicated systems to manage, understand and maintain at all times."

**Part of the secret lies in the inherent stability of the new DSS foils**, compared to that of the inverted T-configuration foils of, for example, a Moth. The new foils, Welbourn maintains, help promote 'easy foiling' with the section, aspect ratio and length of the foil promoting early lift-off (i.e. full foiling in the least amount of wind) rather than ultimate top speed, which would require smaller foils with a less powerful section.

*"It's about finding the best balance between things that allows to you to fly three crew plus a boat with a 60kg bulb - a flying keelboat - without any great drama,"* says Welbourn. He adds that the new generation DSS foil should be scalable, although at the end of the day physics comes into play.

**While foiling ability may be the Quant23 USP**, the boat has many more talents! Thanks to the retractable/removable foils plus keelfin with little bulb, the boat also is a light and very effective 7m-sportsboat, sailed in conventional mode - be it in the light or in more breeze.

It is a very stable and easy to sail platform for sailors who start to explore the boundaries of performance sportsboat sailing and this will make the new boat very versatile and interesting for different target groups.

**Is foiling spoiling the competition?** Clearly not! Actually the Q23 is a sportsboat, which is able to foil easily and steadily. So it addresses not only the existing "Foiling Community", but also the ones who want to start their foiling career without giving up racing against sportsboats competitors sailing in conventional mode.

**Whatever the reason is for sailing a Quant23, it is a breed apart**, with its futuristic-looking, ultra-low freeboard scow hull – blunt bowed, carrying its

hull volume all the way forward and complete with chines and chamfered hull-deck join.

The powerful, stable hull shape, Welbourn maintains, prevents the need for racks and such like, making the boat simple both to build and sail. And you don't even need to shift crew weight fore and aft to alter the pitch of the foil: *"We've previously seen that you really don't have to move around at all actually."*

In terms of her ultimate performance – at present it is too early to say, but Welbourn believes that the Quant23 will be comfortably reaching in the mid-20s (which she proved during the test-week on Lake of Lucerne with 24.5kts of peak speeds and 23.6kts of highest average over 15 seconds)

Most impressive is her foiling ability which will see her foiling upwind in as little as 10 knots. *"From day one we aimed at having an uphill mode, in not a lot of wind, but that's another reason why the foils are so big."*

The first Quant23 is a prototype to be used for R&D prior to the boat going into full production.



## The different driving modes of the Quant23

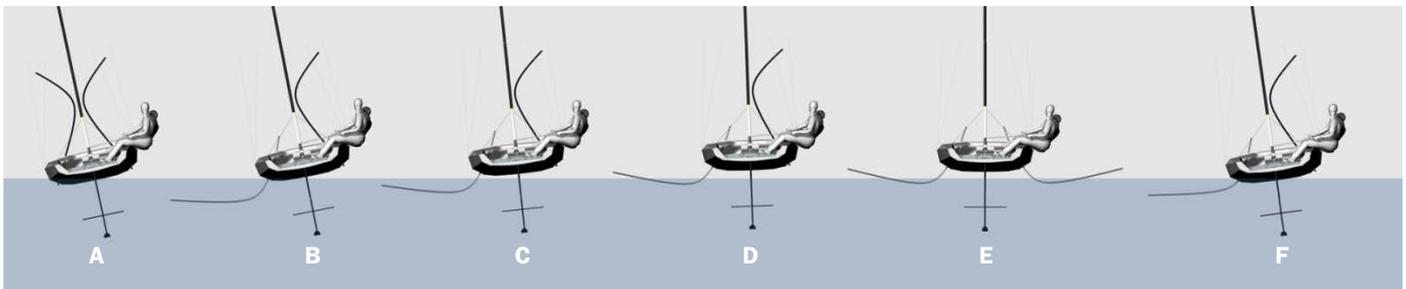
### Quant23 with multifunctional foil-system:

Foiling boats of today generally lack of righting moment. Most of them are very unstable and therefore not really suitable for amateurs and for fun-sailing. Lack of ease in handling and complexity (very costly and vulnerable as well) on land and while sailing, makes most of the existing foiling crafts something just for «pros»!

**The Q23 tries to change this:** It won't be the fastest boat on foils but currently one of the few, on which foiling speed will be a relatively easy to achieve and more enjoyable experience, as boat should do it by itself in a way and other than on centerline foil type of boats where crew has to subdue a totally instable system once up on blades.

**Partially flying:** The Q23 also is be able to benefit of the foils when wind or course doesn't allow full flying. Partially flying, with just a minimum of hull in the water, is be possible thanks to the retained DSS foil functions – this is another outstanding plus other competitors cannot offer at the time

**Versatility:** The Q23 can be sailed also without foils (e.g. very light conditions), spending a lot of fun and speed also for relative beginners and it also includes the possibility to race the boat in any sportsboats-event worldwide and even sail it as a “sailing-school boat”.



**A** Displacement Mode in light conditions (both foils up) or even out - for example if taking part in a sportsboats-competition is your goal. Heel angle at around 10°.

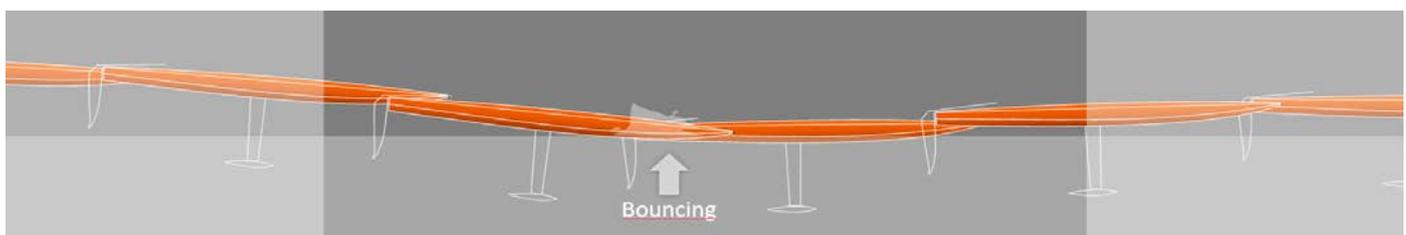
**B** Partially flying (upwind) is easy to achieve as transition from displacement mode to fully flying is a smooth process. Up and fast or down and slow is a thing of the past for this type of foiler

**C** Same as partially flying but in bit higher windspeed. The way to go upwind in around 10 to 12kts true with speeds not over 13 kts

**D** Fully out, boat tends to sail upright: the boards work as a lateral type of a “mild” V-foil self regulating in cooperation with rudder-foil and hull

**E** In a gust both foils can be used to sail downwind in a safer mode.

**F** If the board on leeward side is lifted for about 350mm the foil will work as a “classical” DSS foil which is one of the ways to sail , in wind too strong for foiling.



**Scow shaped Hull keeps boat from crashing:** The Quant23 is a low-flyer (compared to boat-length and compared to most of the center-line concepts). Hull-shape helps boat to get back in position once out of balance (little bounce, with some spray). Huge volume of front boat section and flat angle, provided by this specific hull shape, helps to bring back the boat in a position to make the foil working optimally again (perfect angle of attack).



Foiling in around 15kts true is possible for a crew of two light people (around 70kgs) without the use of a trapeze



The system enables a truly smooth and easy transition from displacement mode to fully foiling



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## Dr. Ian Ward about the Quant23

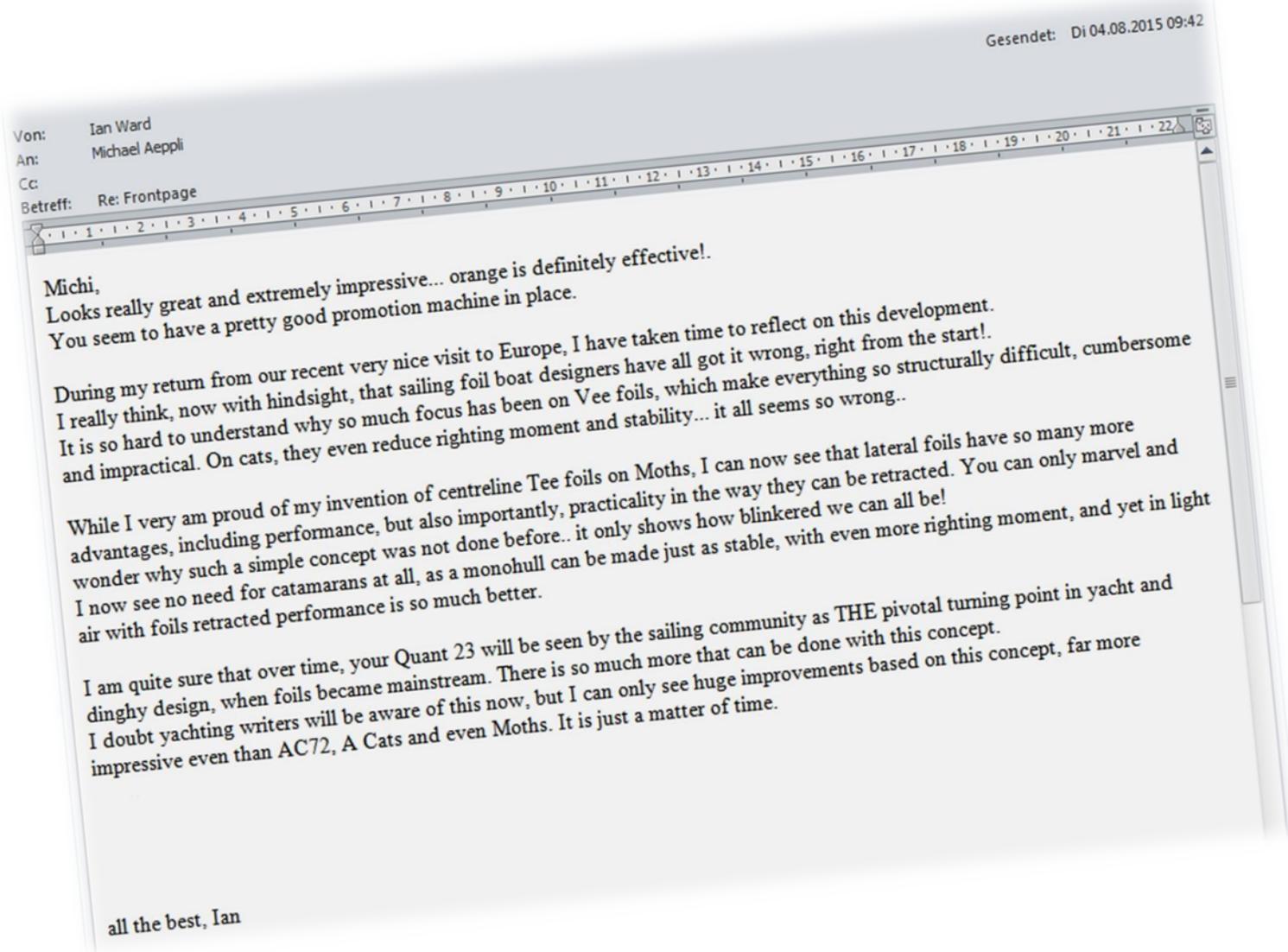
**Who is Ian Ward?** It all began in Grafton NSW/ Australia, when Ian Ward was offered a chance to sail a Hobie tri-foiler designed by Greg Ketterman. Incredible performance in a breeze, but how much better would it be if it were much lighter, simpler and even faster!!

He built a similar trifoiler Moth in 1996 and modified it until in 1999, when struck by a magical thought..... What if it were possible to foil on just the centre-board and rudder foil? The benefits of heeling to windward for increased stability and lift and the low

drag from fewer foils were immediately obvious, what was not clear, was how to make it work and if it was even stable enough to sail.

**First Dinghy Foiler - Moth.** Ian built the first foiling Moth to use centreline foils in 1998 and proved that it really could be done in November 1999. Later, John Ilett independently developed his own foiling Moth in Perth, which kicked off the current foiling craze in Moths.

(source: [www.glidefree.com.au](http://www.glidefree.com.au))



# Design

**The final Q23 concept** only appeared after a long process of evaluation of varying hull, foil and rig configurations.

The slightly unusual scow hull form was attractive in providing a nice stable platform that separated wing lift from the crew weights with the minimum of complication and expense of racks, or indeed ending up as a catamaran to achieve the base stability required to generate the power to foil.

The scow form works well too when sailing as a normal sports boat – sailed heeled in lighter weather the wetted surface is minimal with a slender form, and the great initial stability makes this easy to launch and rig the boat, or simply take the kids out for an easy sail.

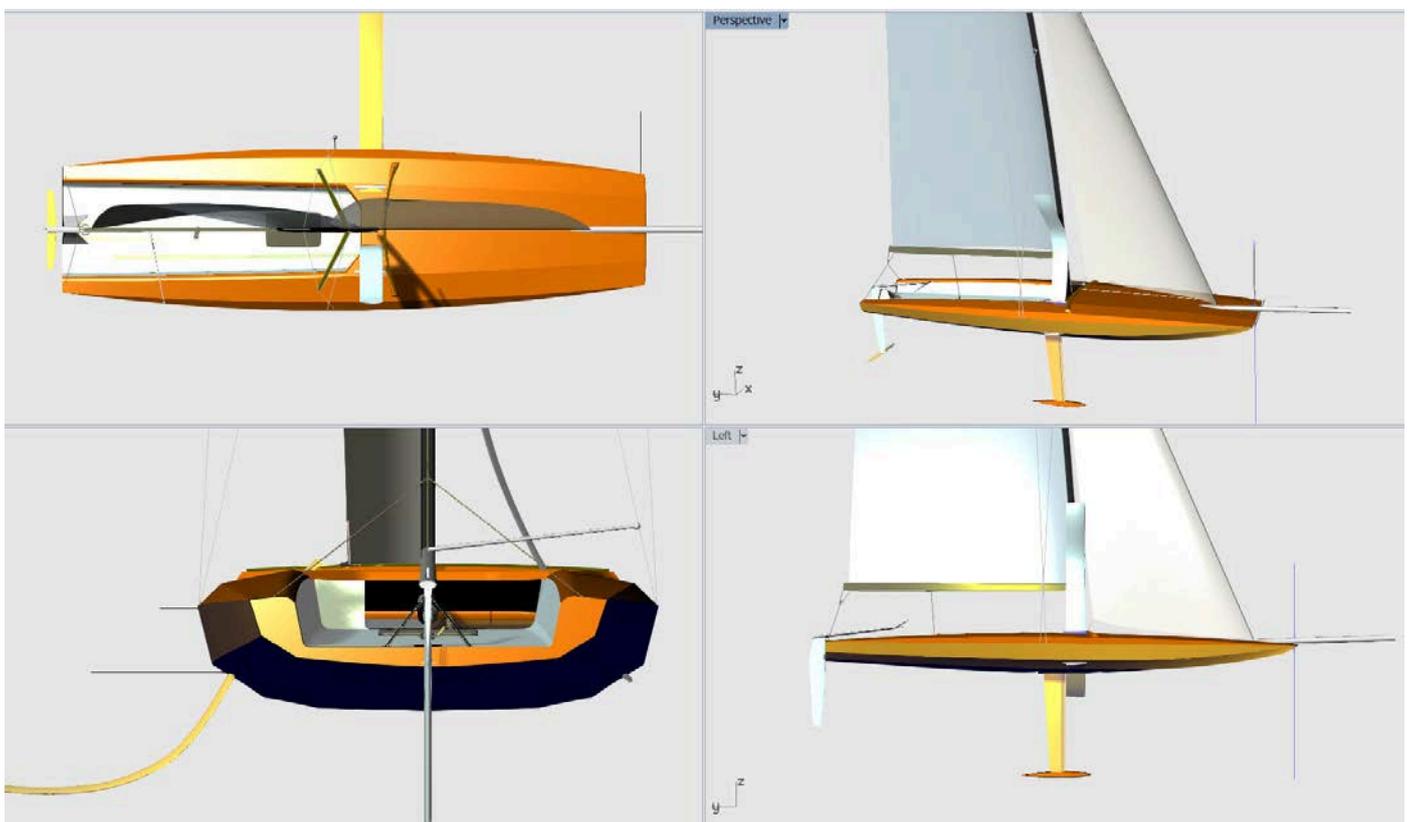
Low flying is also key to the overall simplicity – we can achieve stable flight without the complications of

wands or continually adjusting the foils manually, minor adjustments of the foil angles are simple to allow for varying crew weights, and a great advantage too is that coming off the foils is a non-event – the boat simply bounces like a stone skimming and carries on with very little reduction in speed.

In the interests of safety and recovering from the odd capsize, then 60 kgs of lead on the end of the fin allows for easy righting with only one crew required and also gives that little bit of reassuring stability to the boat when sailing hard in difficult conditions.

So with the concept established, we then needed to build a boat that didn't rely on exotic construction throughout so that the costs could be sensibly contained when in production.

Thus the hull is almost entirely a GRP/foam laminate,



while foils and rig are in carbon, to give the performance required.

Construction with a simple internal framing grid keeps the boat stiff to deal with the high loads that can be seen when in full flight while the C-Tech carbon spars keep the generous sailplan under good control.

Overall weight of around 270 kgs makes for an easy to handle boat for launching and recovery from a light trailer, mast can be raised by two people, and yet the small bulb allows the boat to safely sit afloat on the moorings when required.

Easy flight in low wind speeds has always been the goal rather than the ultimate top end speeds – this resulted in the foils we see now, quite generous chord lengths, good span to generate both righting moment as well as the lift required, and capable of being fully raised or removed when not required.

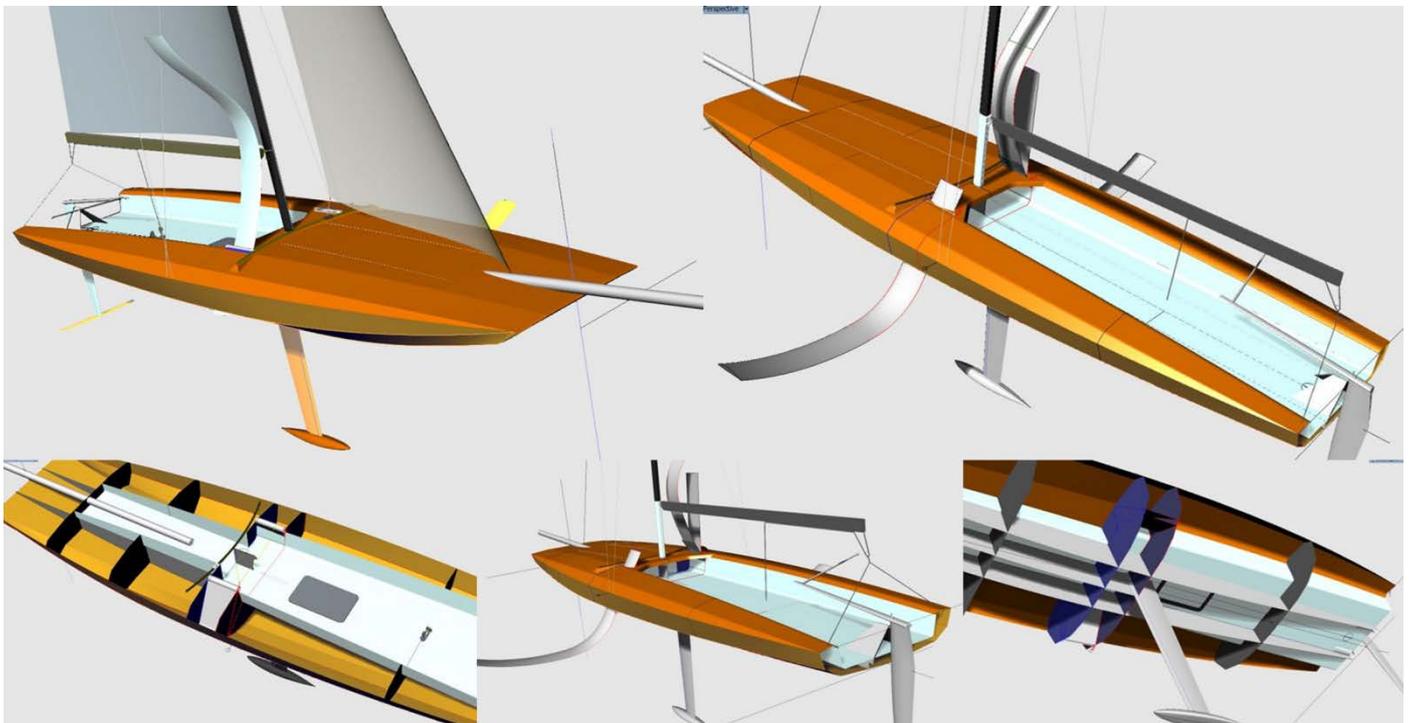
The end result when we took the boat out for it's first sail, fully matched and indeed exceeded all expectations!

We flew on the design base settings first time out with no drama, and as we've continually pushed the envelope then it's become routine to be sailing close to 20 knots, and top end speeds we've seen in the mid twenties – at which point it is becoming quite exciting...

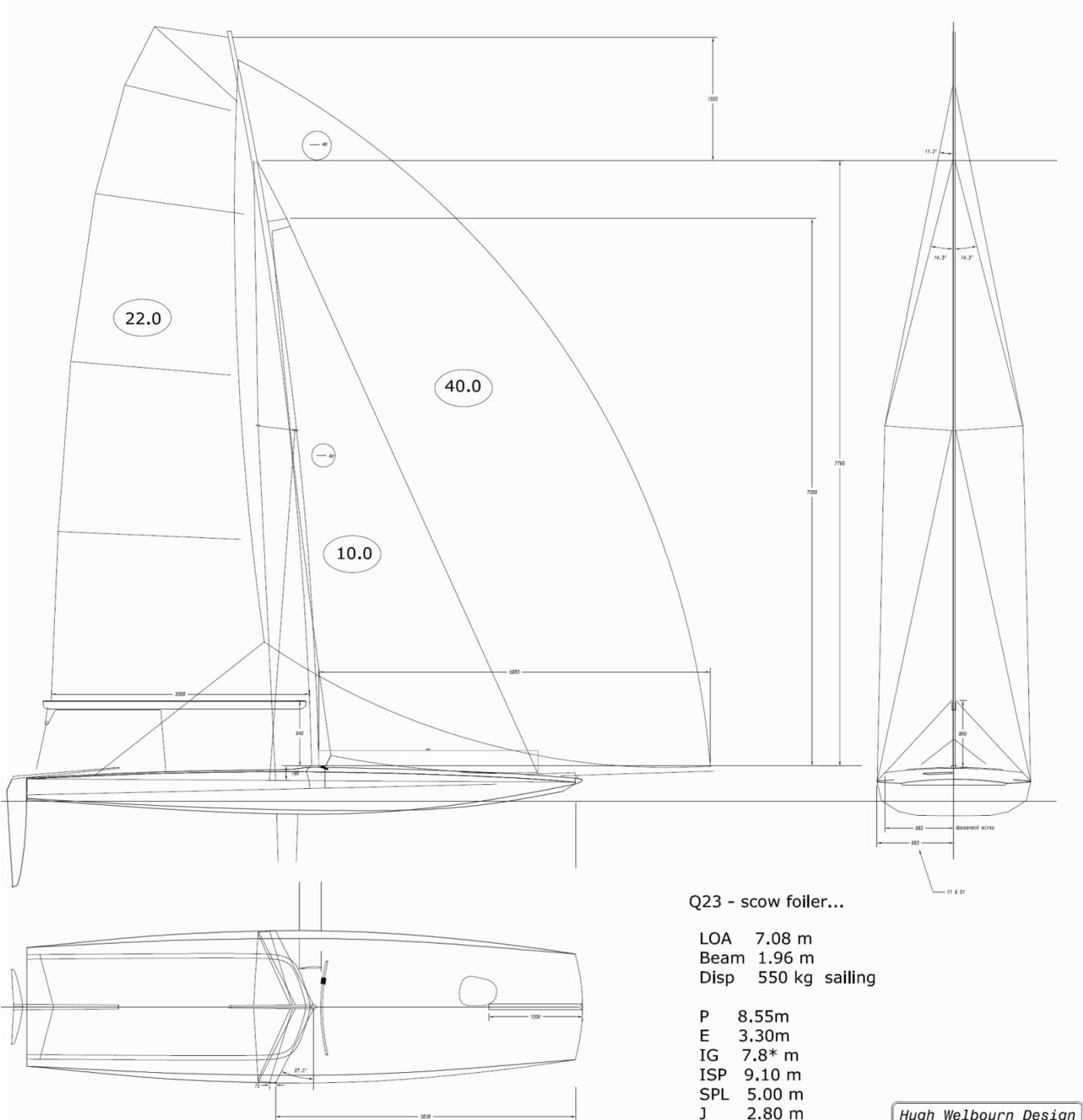
Rig and now sails refinements are all contributing to easier and higher speeds, and the production version includes all the small modifications that we've learnt from the little orange prototype rocket-ship.

**Personally speaking – this is one of the most fun and satisfying design projects ever!**

(Hugh Welbourn Design, Cuttrye Court - East Allington Totnes - Devon - TQ9 7QN, UK)



# Quant23 – Scow Foiler



RM - 2 crew on wire @ 15 approx 1380 kg/m

Q23 - scow foiler...

LOA 7.08 m  
 Beam 1.96 m  
 Disp 550 kg sailing

P 8.55m  
 E 3.30m  
 IG 7.8\* m  
 ISP 9.10 m  
 SPL 5.00 m  
 J 2.80 m

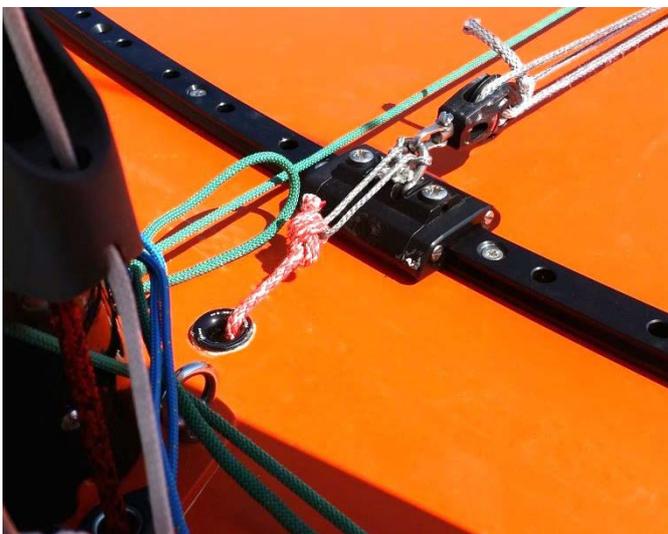
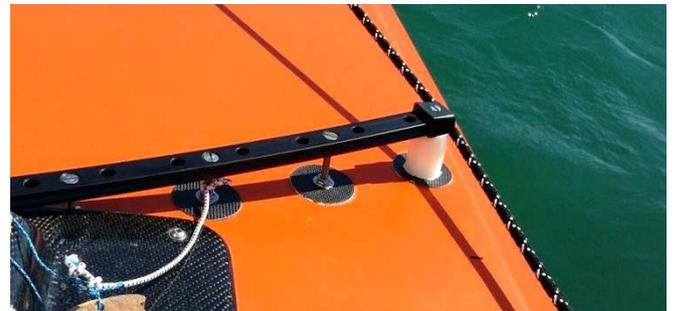
**Hugh Welbourn Design**  
 Culver Court - East Allington - Folkestone - Devon SN6 9JH  
 Tel/Fax 01548 521356 - e-mail hugh@welbourn.co.uk

23' Lake Racer	Q 23
GK & Shaljean #1	Null file scow02/04
Design No. 14/22/GK	December 2014 Size 1:1

## Specifications:

Length over all (excl. GennakerPole)	7.08 m (23')
Beam (foils up)	1.96 m
Beam construction waterline ca.	1.80 m
Displacement, bulb inclusive	270 kgs
Bulb (Lead)	60 kgs
Crew max.	270 kgs
Draft (lifting keel with help of main halyard)	1.75 m
Sail area upwind (Main/Jib)	22 m2/10 m2
Gennaker/Code zero	around 40m2
Built in Composite, Epoxy-Glas combined with Carbonfibre	
Mast: highmodulus round carbontube, grove added	Ca. 9.5 m
Extendible Gennakerpole	
Hatch with big and dry storing room in the center of the boat	
Trailable also with small car, slipping the boat is easier than using a crane.	
Boat can be moored, lying in berth or on dinghy park	
Mast is stepped up by hand (two people)	
Trapeze mainly if boat is sailed without foils, as a normal sportsboat or foiled in some breeze by a crew of two	
<b>Basic boat (sailready, excl. Sails,/incl. Sails, excl. VAT)</b>	CHF 69'900/74'800
<b>Partners (realisation of prototype)</b>	
Projects by Design, Paul Jennings, Cowes (UK)	Hull
Isotop, Dom Pedron, La Rochelle (F)	Foils/Fins/Rudder
Ronstan International Pty. Ltd. , Victoria (AU)	Gear
C-Tech® Ltd, Auckland (NZL)	Rig/boom/pole
Landenberger Sailing, Titisee-Neustadt (D)	Sails/Kite
English Braids, Malvern, Worcestershire WR14 1AL (UK)	Rigging (fix & running )

## Details (Prototype)





## About QuantBoats in brief: Addicted to DSS foils from the start.



[https://www.youtube.com/watch?v=CZS\\_s0a-L1o](https://www.youtube.com/watch?v=CZS_s0a-L1o)

### **Lighter and faster – with the Dynamic Stability System (DSS)**

What is DSS in terms of significance in the world of performance sailing?

- DSS technology is a comparably simple, reasonable and logical way for a substantial performance enhancement. « The customer gets the biggest bang for his buck» (Paul Hakes, Hakes Marine)
- This - we learnt - is also the case for sportsboat of size and type - QuantBoats is developing since 2008.
- Important for a lake boat which really is working: the crew is producing a substantial part of RM (Beam > Racks).
- If this is given (see Q28 and Q30) you will learn quickly that you get «two boats in one» and the decision to chose between a boat for light, medium or stronger conditions gets obsolete (two boats in one – philosophy see quant-boats.com and book «the making of the QuantBoats».)
- In 2008 we discovered this new way of producing RM. We decided very quickly to develop a lake boat in the size of a typical european sportsboat. (Q28).
- Till today our boats are unique and exclusive – and they enjoy the nimbus of unrivalled performance and efficiency in conditions, they have been designed for.

### DSS: Physical Facts and question of acceptance

- DSS works better, the bigger the boats are. You first need a fast boat to benefit from the lift the leeward foil is producing. The transition phase (from where the foil really works) starts from 7kts of boatspeed.
- Easy to understand that a 100' will be able to benefit of the foil almost all the time, as hullspeed is way over this critical minimum of flow around the foil. All the more as such boats are much lighter, than comparable boats of the same size (minus 25 to 33%)
- Wild Oats XI thinks that a DSS foil is a very helpful and performance enhancing item, not only speeding up the boat but also makes it much easier to control (Interview Ian Murray, Yachting World, Dec. 2013)
- It is an undeniable fact that the future of Quant-Boats is very much linked with what «the big guys on the big boats» will decide – concerning DSS. A 100' DSS raceboat is in a mature designing stage

at the moment on the desk of Hugh Welbourn. Such a boat can do up to 700 nm / 24h in appropriate conditions.

- DSS can be combined with a canting keel. You will end up with complexer and slightly heavier boats. But under certain conditions it could make a monohull almost perfect, in both, going upwind, close reaching and downwind.

### Target group and product characteristics

- QuantBoats are racers and daysailors for demanding yachtsmen and -women who always wanted a sailable, high-performance boat and delight in true innovation.
- **QuantBoats always combines unparalleled performance with comparably easy handling on the water – thanks to DSS.**
- QuantBoats are tools for daily use and not reserved just for top notch sailors and professionals. Neither is a QuantBoat a sailing laboratory like many high performance boats of today.



No DSS no drag reduction



Drag reduction thanks to DSS

[https://www.youtube.com/watch?v=s9ilCx8BOA0&list=WL6EF3798581CCC2C9&feature=mh\\_lolz](https://www.youtube.com/watch?v=s9ilCx8BOA0&list=WL6EF3798581CCC2C9&feature=mh_lolz)

## Historical view and Outlook

- Middle of 2008 we first got in contact with the idea of DSS and also with Hugh Welbourn, yacht designer and Inventor of DSS
- We came across to distribute a planned 25' sportsboat for DSS in german-speaking Europe.
- The financial crisis ended this project and we decided in spring 2010 to develop our own boat in cooperation with Hugh Welbourn.
- Starting point was the Q28 (8.5m and 550kgs empty) after having checked existing DSS designs.
- This boat proved to be very quick, but not as easy and simple to sail, as we wanted it (fun, fast but not for mainstream with a character of a little Libera. This boat was scaring potentials a bit).
- With two seasons of sailing we decided to develop a slightly de-tuned version. To be as quick as the prototyp and maybe quicker averaged, we made it a bit longer (Q30).
- We see that if you just offer a pure lake racer – target group is very limited and exclusive. Also because of a relative high price level. This boat should be therefore available in two versions
- Lake version (the current sample)
- Coastal version (same hull, adjusted statics in the hull, slightly shorter mast and beam, racks more solid, maybe a bit more ballast)

**Growing acceptance of DSS** together with the wish to fly of an increasing part of the sailing community – also inspired by the America's Cup of 2013 – we started to develop the idea of a fully flying boat, which ended in late October 2014 with plans of the Quant23, ready for realization.

Other than the Q28 and the Q30 this boat is not designed for lake racing specifically. It can be sailed anywhere in the world. Next to this the target group for this boat is much younger – not only because of

its spectacular looks and character, but only for its more decent pricelevel.

We wanted a boat for a crew of two or three, where DSS foils are arranged in way, so that the boat will fully fly, at least half- and downwind.

Not as high up as a Moth or other recent foiling sailcrafts - but hull should completely leave surface of the water and the system should be a derivative of the "conventional" DSS foils.

In our perspective the production of righting moment with the help of foils is even more important on fully flying boat than on the semi-foiler type of boat like the Q28 and the Q30.

**If you analyse the recent market of foiling sailing vessels, you have to admit that righting moment doesn't play a big role – which we think doesn't favour the ability of a boat to foil easily.**

**Website: [www.quant-boats.com](http://www.quant-boats.com)**

The site offers a wide variety of informations, pictures and also links to articles, clips and news-blog with the latest informations etc.

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## Light-air-foiling

Benoît Marie – Minitransat Winner, successful Moth sailor and vice champion of the little America's Cup 2015 (C-class catamarans) tested the Q23 in pretty light air. This is what he said about his latest sailing experience:

*"I want to say a big THANK YOU for the test ride on the Quant 23, I was truly amazed of the performance and the sensation you get on this boat. But what really strikes me is the ease of use of this boat. No need to be a pro to sail it. I would actually take my mother for a sail very easily, to give her the thrill of flying without fearing a big crashes, happening painfully on other flying boats. Now, flying in 6-7 kts of wind on a keelboat is something I would never expect... But you nailed it perfectly ! Well done, I think this product has a great future, even in sailing school, you can just bring everyone to the foiling world in this boat... A big BRAVO !!!"*  
(Benoît Marie, Lake of Zurich, Sept. 23rd 2015)

