

Specification

for SAILSetc International Marblehead & Ten Rater

PRIME NUMBER & DIAMOND

prices will be found on the boat order form and are valid for boats planned to be built by end of 2012 and paid by end of 2012

background information & news – see last page

HULL MOULDING – OUT OF MOULD STATE

hull moulding with the following features

- moulded in pre-preg carbon
- 1 layer of 200 grams/m² + 1 layer of 125 or 150 grams/m² woven carbon
- weight of about 340 grams for PRIME NUMBER with openings trimmed
- weight of about 440 grams for DIAMOND with openings trimmed
- DIAMOND has length 1.68 metres when finished with bumper
- natural black carbon finish
- laminated in one piece with 20 mm flange around aft deck opening(s)
- centre deck with deck level pot recess & foredeck built in
- fin box and mast tube moulding built in, mast tube for conventional rig only
- swing rig version of PN has an additional mast tube for swing rig
- headsail sheet fairlead recess, (not swing rig version of PN) headsail boom swivel recess & block mount recess built in
- recesses for the snap in/out rigging screw system (not on swing rig version of PN)
- witness marks for setting out positions of fittings
- supplied with A3 format general arrangement showing position/size of major component parts
- instructions & plans

options

for PRIME NUMBER you may choose the conventional rig version or the swing rig version.

to take the out of the mould state moulding to Hull Moulding Only stage you will need the following

epoxy resin + filler + labour

HULL MOULDING ONLY

The 'out of mould state' moulding as above is progressed as follows:

- bow (+ stern for 10R) bulkhead is low density epoxy filler

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- weight of about 320 grams for PRIME NUMBER with openings trimmed
- weight of about 420 grams for DIAMOND with openings trimmed
- foredeck cut outs and hatch opening for access to rc are formed
- PRIME NUMBER hulls are abraded to 400 grade
- DIAMOND hulls are left with the surface as moulded
- supplied with A3 format general arrangement showing position/size of major component parts
- instructions & plans

options

for PRIME NUMBER you may choose the conventional rig version or the swing rig version.

to take the Hull moulding to Hull Kit A stage you will need the following

structural parts

fin

rudder

ballast

HULL KIT A

hull moulding as above with the following items

supplied

- deck to hull connection near aft waterline ending (not PRIME NUMBER)
- sheet post trunking *
- rc support, cut outs for RMG winch and Futaba/Hitec servo marked but not cut
- bracing for shroud points & plates & connectors for snap in/out rigging screw system *
- mast gate *
- moulded fairlead 67g for under deck sheeting
- two foredeck tubes for headsail swivels
(for A rig and 10 Rater No 1 rig on PRIME NUMBER)
(for No 1 & No 5 rig on DIAMOND)
- fin moulding, item 370a, length from bottom of hull to lower end of fin is 515 mm, requires cutting to length – see Note 1 -, finishing to section and adding fixings at top and bottom
- moulded rudder, 4 mm stainless steel stock, item 360b, requires finishing and fitting to hull
- ballast casting in natural cast state with fin slot, item 200-036 (PRIME NUMBER) or 200-042 (DIAMOND)
- instructions & plans

* (not on swing rig version of PRIME NUMBER)

all moulded parts are in carbon/epoxy with a natural carbon finish

options

for PRIME NUMBER the following:

choose between the conventional rig version or the swing rig version

for the swing rig PRIME NUMBER the following:

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a set of mast blocks to allow adjustment of the mast rake, item 139-3022
a set of parts for, or a completed, mast gate to allow use of conventional rigs

to take the hull kit A to Hull Kit B stage you will need the following

resins
fillers

HULL KIT B

hull kit A as above with the following items

fitted

- deck to hull connection near aft waterline ending (not PRIME NUMBER)
- sheet post trunking *
- rc support, cut outs for RMG winch and Futaba/Hitec servo with bolts installed (for quick release system) – *advise if an alternative rc installation is required*
- bracing for shroud points *
- mast gate * and plastic part of mast/deck adjuster added *
- moulded fairlead 67g for under deck sheeting
- two foredeck tubes for headsail swivels
(for A rig and 10 Rater No 1 rig on PRIME NUMBER)
(for No 1 & No 5 rig on DIAMOND)

supplied

- moulding used to modify the bottom of the rc containment pot (not DIAMOND)
- fin moulding, item 370a, length from bottom of hull to lower end of fin is 515 mm, requires cutting to length – see Note 1 -, finishing to section and adding fixings at top and bottom
- moulded rudder, 4 mm stainless steel stock, item 360b, requires finishing and fitting to hull
- ballast casting in natural cast state with fin slot, item 200-036 (PRIME NUMBER) or 200-042 (DIAMOND).

* (not on swing rig version of PRIME NUMBER)

all moulded parts are in carbon/epoxy with a natural carbon finish

options

for PRIME NUMBER you may choose the conventional rig version or the swing rig version.

fittings pack

parts required to fit rc (as per the standard SAILSetc method)

to take the hull kit B to Part Completed Hull stage you will need the following

fittings pack - does NOT include a switch

fillets for leading edge of fin and rudder

mast heel moulding for bottom of mast tube

nut pads to bond over nut heads

circular cover pad to bond over backstay wire

resins

fillers

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silicone sealant

PART COMPLETED HULL

hull kit B as above with the following tasks completed

- fittings pack fitted includes fitting drain bung, backstay attachment, rudder tube & top bearing, tiller arm and servo/tiller connector, sheet post *, pot for rc containment, fin bolt, mast/deck adjuster *, winch line running gear with turning block, headsail sheet fairleads, headsail boom swivel attachment points *, bow bumper
- foils fitted to hull the fin is cut to profile, bolt and threaded insert fitted, the length is cut to give the standard draught of 585 mm, the edges are sealed and the whole is adjusted to fit the hull in the correct alignment, the rudder profile is trimmed to fit the hull correctly
- foils finished to section the fin and carbon rudder are finished to section and fillets are added at the leading edge of both at the hull
- ballast fitted and finished see note 4 the ballast is fitted to the fin and a recessed nut is used to retain it in place – the ballast is faired, adjusted to weight and prepared with 100 grade abrasive ready for final finishing and spraying with grey primer
- carbon coated ballast only available for DIAMOND
- rc tray finished the rc tray has the apertures cut for the servo and winch and the quick release system is added

* (not on swing rig version of PRIME NUMBER)

options

the rc tray may be cut to fit the rc equipment you specify
non-standard ballast weight – please ask about options
non-standard fin length – please ask about options
short fin – short fin supplied in addition to standard length fin
parts required to fit rc (as per the standard SAILSetc method)

to complete the Part Completed Hull you will need the following

rc equipment

rigs

measurement

final fair and spray ballast (an option if the boat is to be collected from SAILSetc)

FIT RADIO CONTROL EQUIPMENT

fitting radio control equipment can be done if it is provided by yourself
work required to achieve the specification you want will be timed and charged for accordingly

the following equipment should be provided to us

- 2 channel transmitter & receiver
- battery pack for transmitter
- sail winch - preferred winch is RMG 280 winch with standard 42 mm drum
- rudder servo – preferred servo is Futaba 9450 or Hitec equivalent
- battery pack for boat to match requirements of winch

for more complete information concerning rc equipment see the appropriate worksheet on the boat order form (click on the tab at the bottom of the boat order form)

NB it is essential to advise SAILSetc which rc units will be provided by the time we start to build please

the following work/parts are provided by us and charged for as appropriate

- plug/socket on aerial/receiver and as required – AERX
- aerial – AER
- water resistant switch if required – SWB
- mounting plate for winch – 67diag
- deck lines added to winch – D30, D50, D75
- tension system for main winch line – 46b, 61h, 67j
- servo arm extender – 67b
- other parts/fittings as required

MEASUREMENT of YACHT with ONE RIG

(see rig order form for rig prices, measurement does not include adding sail marks)

- number + national letters engraved in hull
- number + national letters applied to deck
- hull limit mark (PRIME NUMBER)
- waterline limit marks (DIAMOND)
- measurement forms ready to send to certification authority

measurement of additional rigs (each rig)

- measurement forms ready to send to certification authority

PACKAGING, PACKING and CARRIAGE

Collection of the boat and rigs will mean you avoid any packaging, packing and carriage costs. You may wish to bring or purchase one or more rig bags to ensure that these are protected

during your return journey. Alternatively consider making a rig box to bring with you when you collect the rigs.

If the goods are to be sent to you, in the UK or outside the UK, then the packaging, packing and carriage costs will depend on the other options you choose, your own location, and the method of delivery that you prefer. We can give you some idea of the costs involved, and an absolute maximum figure, but cannot determine the actual figure until your final order is confirmed.

Background

In late 2005 we experimented with a hull made for us from pre-preg carbon using the ROK mould. The result was very encouraging and we have continued to explore this method of making hulls. In fact, except for our IOMs, all our boats are made this way now.

New moulds for PRIME NUMBER were made in early 2006 and the prototype boat finished 3rd in the 2006 world championship sailed by Zvonko Jelacic who had not raced a Marblehead before. In 2nd place, on the same points, was a ROK built in 2002, sailed by Ante Kovacevic who has not raced Marbleheads for many years.

New moulds for the A Class SWORD were also made in early 2006 and all new SWORDS will be made this way.

Rather than make a new mould for the 1999 design Ten Rater PRIZM we revised the design a little to take advantage of the lighter build weight and in light of experience gained since 1999. The new Ten Rater, called DIAMOND, should be sailing in spring 2007.

The pre-preg hulls have several advantages. They are stronger, stiffer, heat resistant and longer lasting hulls, with the possibility of supplying hull mouldings and hull kits almost 'from stock' and more time available for us to carry out other work. One side effect (possibly good, possibly not so good) is that the natural carbon and clear resin produces a black hull thus requiring the hull to be painted/sprayed if you want any other colour.

So, except for our IOMs all our boats are now made using this method. We do not see this as an immediate option for IOM hulls because clear glass is not so attractive as a hull finish.

During 2006 we were in the process of learning about the methods and costs of building boats this way. Initial indications were that price of hulls made using pre-preg would remain about the same and for 2006 we are kept the price the same as for hulls made using the previous method. Having settled down to a system that gives us excellent and consistent results we have found, perhaps inevitably, that this is no 'magic' way of making top quality boats less expensively. Thanks to the aircraft and defence industries, as well as industry as a whole, waking up to the benefits of carbon fibre the cost of this material has escalated a lot recently. While we have good stocks of our own materials we can keep price rises for parts made in house to levels close to inflation. However, we cannot do that for carbon products that we buy in. Thus the price of the pre-preg hulls (as well as carbon tubes) has risen considerably.

The high price of a Marblehead and Ten Rater hull moulding is due partly to the price of the process but also reflects the very much larger amount of value that is built into the hull moulding itself. The hull shell is a very complete moulding and, apart from details that help with the fitting out, now even has the fin box and mast tube moulded in from the outset. Because of the extra

completeness of the primary hull moulding the cost of getting to the completed boat stage has been reduced. There is also a benefit in consistency.

Our boats have always had a reputation for excellent performance and value over a long term and we are confident the extra longevity achieved by the pre-preg building process for these thoroughly well proven designs will make the increased costs fully justified. Indeed the 2002 designed PRIME NUMBER made a particularly impressive showing at the 2010 GBR national championship where it won all but 2 of the races on the 2nd day to take the trophy by some 30 points. It was a newly completed boat that had not been on the water before the championship.

For the 2010 season we have made a modified deck mould that permits PRIME NUMBER to be fully optimised for use with swing rigs. The boat has two mast tubes; one each for swing rig and for conventional rig. The lowered area of deck around the conventional rig is retained so that low level conventional rigs can be used to maintain stability. The foredeck has a recessed slot for attachment of the headsail boom swivels and struts are used to connect that recess to the underside of the hull securely. A set of mast blocks is available that permits swing rigs to be raked to adjust the balance of the boat. A moulded mast gate that slots into the swing rig mast tube to provide support for conventional rigs is also available.

Note 1

The standard draught of circa 585 mm gave 'best all round' performance across a range of conditions from 1992 up to 2006. We suggested 20 mm less if sailing in light airs frequently and 20 mm more if sailing in a breeze for much of the time.

The PRIME NUMBER (and ROK) that did so well at the 2006 world championship used a draught some 60 mm larger than standard but it was an exceptional week of strong winds. The same boat used at a 2 day event of lighter conditions, although still capable of winning, lacked pace and we remain confident that the advice above is sound.

As many other Marbleheads use a relatively large draught it would seem possible to maximise the relative performance of PRIME NUMBER by increasing the standard draught from 585 to 610 mm as. This will promote performance in heavier wind while keeping a distinct edge in light airs. Again we suggest 20 mm less if sailing in light airs frequently and 20 mm more if sailing in a breeze for much of the time.

The 2010 GBR national championship was a good opportunity to test this approach. Using a 610 mm draught and standard 3.6 kg ballast a PRIME NUMBER was comparable in performance to a swing rigged, deeper, narrower and lighter boat on the first day of A suit conditions. On the second day when boats used B rig the PRIME NUMBER showed remarkable superiority over the other both to windward and round the course.

Changes outside that range may give better performance in a limited range of specific conditions depending on the competitor designs.

The PRIZM design has competed incredibly well across the full range from light airs to No 5 rig using the standard draught of 585 mm and DIAMOND seems well optimised at much the same draught.

Note 2

The ballast is given an upward tilt of 2 to 3 degrees. Small variations from this are possible by using suitable size packing pieces between the ballast and the fin in the slot. You may want to test less or more upward tilt. If fillets and/or fairings are required between ballast and fin then you will have to specify the ballast tilt required.

Note 3

The standard ballast weight of 3.6 kg gives 'best all round' performance across a range of conditions. Lower ballast weights will promote light airs performance to a limited extent at the expense of performance especially to windward when heel angle exceeds 20 degrees. Generally we would expect a shorter fin will promote light airs speed more efficiently than a light ballast.

Note 4

SPRAY FINISHED BALLAST NO LONGER AN OPTION UNLESS BOAT IS COLLECTED

We much regret this step but carriers/couriers have continued to perform abysmally and frequently wreck our nicely finished ballasts in spite of our best efforts to protect them during delivery. Two things compound this failing. The package itself is rarely damaged when the goods are delivered to the customer so the customer signs for delivery (thus accepting the goods are satisfactory). Any claim against the carrier is then impossible – they argue the packaging is inadequate and the customer signed for the goods anyway. The customer is unhappy. We are fairly un-impressed too especially as we spend a lot of time and money on packaging and, amazingly, have also paid for insurance..... and time spent complaining is usually a total waste of more of our valuable time.

No one carrier is any better than any of the others so we have accepted that we cannot offer spray finished ballasts unless they are collected from our workshops by the customer. We will offer ballast up to 'ready to final fair and spray' stage leaving the customer the task of finishing this item. If the ballast arrives damaged it is usually only cosmetic damage to the aft end and this can be rectified using polyester filler before going on to the spray stage. We have always used grey cellulose primer spray as it gives the best coverage in the shortest time. It is easy to rub down to a smooth finish and easy to re-touch if the surface is marked.

One Metre and Ten Rater ballasts may be carbon coated for an additional charge. Thankfully these survive the attentions of the carriers a little better than sprayed ballasts so we will continue to offer these as options. However, unless we can make these items in Tungsten I think we will never be able to fully guarantee delivery of a ballast in perfect shape.

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