



*the boat the world sails*

## **“Introduction of carbon masts” MEETING MINUTES**

Minutes of the “introduction of Carbon masts” meeting held on 24<sup>th</sup> of March 2017 at Nautical Club of Arenal, Palma, Spain

### **Present:**

Nino Shmueli (NS)  
Andreas Kosmatopoulos (AK)  
Simon Bevan – Super Spar masts (SB)  
Steve Norbury – Selden masts (SN)  
Kei Takakuwa – North Sails JPN (KT)  
470 Sailors  
470 Coaches  
Team Leaders

### **1. INTRODUCTION**

Nino Shmueli welcomed sailors and coaches to the meeting and presented the 470 Management committee’s point of view on the carbon masts.

NS explained that at the GAM in November 2016, 56% of the votes were in favour of the carbon mast but the 470 Class Constitution prescribes a 2/3<sup>rd</sup>s (67%) majority to implement a change. As a consequence, the 470 Class is giving further opportunities for sailors to test and sail with the mast ahead of submitting the issue for approval again at the next 470 GAM in July, to be held during the 2017 470 World Championships. It was pointed out that the introduction of the carbon mast will strengthen the 470 class in the quest to stay in the Olympics; the boat will be modernized and up to date, will be more attractive to new sailors and will reflect the research and equipment evaluation and development which are part of our class. Furthermore, a 3-piece mast will be easier to transport, easier to buy directly from the manufacturer, easier to travel on the road and technically carbon is a better material than the aluminium.

Five brand new carbon masts (3 Super Spars and 2 Selden) were inspected by the sailors during 23<sup>rd</sup> and 24<sup>th</sup> March and many questions were answered on site by the manufacturers’ representatives, SB & SN.

NS presented the two manufacturers who were then given the floor to discuss all technical information and answer all related questions

### **2. TECHNICAL**

SB and SN presented the technical details and the mast production process on the following key points:

- The bending characteristics and the stiffness of the produced carbon masts are similar to the existing aluminium masts. The existing sails can match the new carbon masts.
- The 3-piece carbon masts (approx. 2.6 m length each piece) can be shipped with UPS and reduce transport costs. Sailors can take their masts anywhere in the world and/or order it directly from the factory without the need of a dealer, keeping the prices lower.
- Carbon mast is very strong and durable, will not acquire a permanent bent under excessive stress and is less likely to break.
- Carbon mast characteristics will be more consistent compared to the aluminium masts
- The production process is based on computer control and that makes the process reliable with small tolerances between masts. Due to the process the masts are coming out straight.
- The mast specifications will permit at least two versions: a flexi and a stiff mast as we have with the aluminium.

- The carbon mast bending or stiffness characteristics will not change over time as it was evidenced with other dinghy carbon masts even after 10 years.
- The carbon mast set up was exactly the same with the aluminium masts and on the water some chocks and spreader angle adjustments were enough to shape the sail properly.
- There is no impact in the boat's stiffness and no changes or extra reinforcements are needed.

### 3. CONCERNS – Q & A

The sailors raised concerns linked to the control of the mast production so that there will be no teams with custom masts. NS answered on how the class can control the carbon masts and assure the athletes that they will compete on equal terms.

- The class will control the production by measuring the weight, stiffness, diameter and thickness at the factory and at the events. Anything out of the rule tolerances will be rejected and this will lead to the withdrawal of the manufacturers licence. No mast will leave the factory if characteristics vary outside the agreed normal.
- The masts will have serial numbers in the separate pieces and they will be colour-coded based on the stiffness in order to avoid mixing the parts.
- The price will be agreed by contract and will not be raised over time without prior agreement.
- Up to three mast-builder licenses will be given initially, after investigation by the class to ensure the high quality of the final product.
- Teams will still be able to choose mast stiffness to suit their weight: although each supplier will produce up to three different spar stiffness's, spars from one supplier will differ from the other suppliers. So with two suppliers there will be up to six different stiffness's, with three suppliers it may be nine. This should give the sailors enough choice with the advantage that once they have decided what they want, they can buy the same stiffness mast again in the future, and everyone will know which weights of crew are using which stiffness of spar.

KT mentioned that the deflection measurements are static and on the water there are such differences that a new sail design will be required. Six months of testing will result into the ideal sail shape.

It was noted that other classes (i.e. Tornado, 49er) changed to carbon masts but they found differences in stiffness. SB and SN ensured that they are in position to keep small tolerances, based on their proven and reliable production processes.

### 4. REQUESTS

Sailors and coaches want to have access to the measurement, results and bending test methods to be sure about the carbon mast properties and to compare them properly with the aluminium ones.

#### Decision

**It was agreed by the class, SB and SN that the masts will remain at the sailors' disposal for measuring, inspecting and testing on the water during Palma, Hyeres and the 470 Europeans.**

**Sailor's feedback is vital and along with comments or questions can be sent to [office@470.org](mailto:office@470.org)**