

470 Class - Carbon Mast Q & A:

Why will a carbon mast be better for the 470?

- The Carbon mast will be supplied in 3 parts which will make it a lot easier and cheaper to transport. Class rules will specify the positions of the joints.
- Carbon masts will last a lot longer.
- The bending characteristics will not change over time.
- They are much harder to break.
- With proper UV protection, mechanical properties will not deteriorate over time.

How will you make sure carbon masts will be available to all sailors?

- We will set up a date for pre ordering of masts, well ahead of the time when the masts are approved for use at events.

How will the builders be controlled?

- The class will license each builder.
- Each builder will be allowed to keep in production up to 2¹ different mast sections at the same time.
- The specification for each mast will be submitted to the class and must be the same over the production run of that model, so there can be no 'special' masts.
- Masts must be commercially available to any sailor.
- Masts must be built from Standard Modulus² Carbon fibre and Epoxy Resin. Detailed material specifications will be submitted by the builders to the class during the licensing process. Controlling this with each manufacturer will ensure that the stiffness of the mast tubes is controlled.
- The mast spar must be round tube with Aluminium or Plastic (no carbon) external sail track.
- No new builders or specifications will be approved in a specified period before the Olympics, in the same way as it is happening with the hulls.

How are we avoiding sunlight deterioration of the 470 Carbon Masts?

- All masts will be required to have some sort of UV protection either as a coating or within the resin system. The mast builder's specification will require all masts to be coated as and when required.
- If the paint is kept in good condition then the sunlight will not harm the mast at all.

How do we know that the masts from each model will all be the same?

- Each builder will be allowed to offer a specific number of different stiffness mast models. There will be a very small bend deflection range that each of these masts must always be between. The class will be able to check from time to time to ensure that they are all within this tolerance.

¹ At the time of publishing, there are ongoing discussions with some builders about raising this number to 3. This change is not confirmed yet.

² Standard carbon modulus of elasticity is generally defined as 230-240GPa. Builders must submit the material data as provided by the material manufacturers, in the same way the hull builders do it now for hull materials.

Why not to have only one builder and only one mast spar stiffness?

- The big strength of the 470 is that you can choose your own equipment. This allows a lot bigger range of crew weights to be competitive.
- It means that a light crew can be fast in heavy airs and heavy crew fast in light airs when they develop the right settings for those conditions. This is one of the skills of sailing and the 470 is one of the few classes in the Olympics that still test this skill.
- The 470 Class is not limited by manufacturing restrictions of its equipment, and anyone can request a license to produce hulls and now mast spars. Everything else is free to manufacture as long as it is kept within the rule limitations and requirements.

Will the carbon masts be lighter than the aluminium masts?

- Yes. The mast weight will be reduced by about 1 kilogram and the overall boat weight will also be reduced by the same amount.

How can the aluminium masts be competitive if the new masts are lighter?

- The new weight limit will be the same for all mast. Aluminium masts can now use lighter fittings and rigging, and the lighter aluminium masts will not need mast corrector weights anymore. The weight difference will not be so dramatic. In the past there were many successful 470 masts that were considerably heavier than the minimum permitted weight.
- The boat - mast combination will also allow heavier masts to be used with a lighter boat without boat corrector weights.
- In any case, the use of carbon masts at an event will be controlled by the notice of race: the events where carbon and aluminium masts will be racing together will be carefully selected according to the class policy.

When will the rule change?

- The proposed timeframe for the introduction of carbon masts is September 2020, to be available for the 2024 Olympic cycle.
 - ✓ If this choice is confirmed at the 2017 GAM, then they would be available for racing immediately after the 2020 Olympics.

The wealthy nations will have a big advantage and will be able to buy masts from every manufacturer to test.

- Yes. The wealthy nations are always able to buy more equipment to test, not just masts...
- They do this now for aluminium, so nothing will change.
- The big difference is that now everyone else will be able to see what they choose and will then be able to go and order the same mast. The less wealthy nations will be able to benefit from the testing that the wealthy nations do without spending that amount of money. You can be more confident now, that you can buy the same mast model as one of the top sailors.

Can I replace fittings and carry out repairs on my carbon mast?

- Yes. Carbon is softer than aluminium, so you need to be more careful drilling out old rivets. But you can add or replace fittings the same as on an aluminium mast.
- Any repair to the carbon mast will require the permission of a measurer before the repair is carried out.

Will the new carbon masts fit in older boats?

- Yes, there is no difference in that respect. The carbon mast heel fittings will still fit in existing mast steps. Depending on the final decision on the external spar diameter, different amounts of non-friction material may have to be needed at the mast gate, and this will be the only action needed by the sailors.

What is the effect of the use of a carbon mast on the hull structure?

- The sail plan will stay the same, the wind forces will be the same so there is no expected side-effect of the carbon mast introduction on current hulls.

Carbon masts have been used for Olympic and many other Classes for over 20 years now. All classes using carbon masts have proven that they last longer and are a lot harder to break.

The 470 has used the experiences of these classes to ensure that the new proposed 470 mast rule will produce the most cost-effective carbon mast possible.

