## 3 Carbon-fiber Mini 6.5s Manufactured in Izmir!

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Three M.A.T. 6.5 Minis manufactured by M.A.T. in Izmir are amongst the most advanced and best performing boats ever produced in Turkey. Fully loaded, weighing 900 kg, these 6.5 m long carbon-fiber racing yachts can achieve very high speeds thanks to their 85  $m^2$  of gennaker and 29  $m^2$  of main sail: 20-25 knots cruising speed!

Mini is a class widely used particularly in France. In fact, France is a country brimming with extreme yachting. The boats manufactured by M.A.T. –through their hull numbers, 414, 415, and 416– give clues about the popularity of the mini class worldwide. The boats received bow numbers in the order of their building, since the launch of the first mini.

The class evolved significantly since its birth: boats became lighter and rigs got their modern shapes to support much larger sail areas.

Numerous races are organized every year for the mini class. Buoy races and offshore distance races, sometimes for singles, sometimes for teams of two.

Indisputably, the most challenging race awaiting the mini class is a test of endurance, from northern shores of France to Canary Islands, and then to Brazil. This race for singles is called Mini Transat, and is organized biannually. Many famous skippers of the world prove their mettles in this race, before moving alone to other races such as Around Alone.

The France-Brazil course is completed in less than three weeks. Sailing in the night is riskier and much more difficult. It takes time to adapt oneself to the events after waking up and climbing up to the deck in the dark. That is why skippers prefer to hold tiller on night, and sleep in daylight when the boat is in autopilot. In such a solo race the autopilot is one of the most important components of a boat. Indeed, there are remote controlled autopilot units, controlled through a remote such as a wrist watch, specifically crafted for such races.

Boats built by M.A.T. are designed by Berret Racoupeau Yacht Design of France, while engineering assistance are provided by SP Systems, rig from Sparcraft, sails from North Sails Turkey, deck equipment from Harken, and finally ropes are from Liros. The LOA and LWL of the boat is 6.50 m, while her width is 2.95 m. A 3 meter carbon-fiber bowsprit allows a spinnaker area up to  $85 \text{ m}^2$ . The main sail is 29.7 m<sup>2</sup>, while jibs are 11 m<sup>2</sup>. Fully equipped and loaded, the boat weighs 900 kg. The stripped out hull does not exceed 95 kg. A lead bulb keel of 320 kg in 2.00 m depth at the end of a fin can be canted 30 degrees starboard or port windward, with the help of the purchase and winch. There are two more carbon-fiber daggerboards on two sides of the mast in order to prevent leeway when the keel is canted to the max. Double carbon-fiber rudder hangs on the transom. There is a watertight compartment at the bow. On the transom are a life raft and an escape hatch for emergencies.

Alp, one of the shareholders of M.A.T. describes the production as follows: first a 1:1 wooden model is produced in order to manufacture the female hull and deck mould. The mould plays a critical role in ensuring a smooth and light hull. Otherwise the paste applied to smooth out the imperfections of the hull would cause an unnecessary as well as undesired weight in a boat of such dimensions. For a perfect model, the frames are cut in computer controlled router planes. Difficult parts with sharp edges, such as the bow are shaped on 5 axis CNC machines. Keels and rudder blades are given their shapes exclusively in CNC machines.

Bi axial +45/-45, 0/90, and unidirectional carbon-fibers, unidirectional aramid fibers, Airex PVC foam, SP Systems epoxy resin have been used on the hull and deck. These fibers make it possible to produce incomparably stronger and lighter hulls and decks than glass fibers allows. The sandwich structure obtained by applying PVC foam between the internal and external skins provides a rigid but light construction.

Vacuum technology: Carbon-fibers hand laminated to female moulds can be subjected to more resin than necessary, however, excess resin in a composite product is no recipe for strength and lightweight. Hence, the application of vacuum technology prior to curing, in order to remove the excess

resin. Furthermore, the vacuuming –through subjecting lamination to pressure– also eliminates voids and ensures the fibers take the shape of the mould. The resin/fiber ratio is adjusted to the desired level through time-measured application of vacuum.

Post-curing (oven-drying): Epoxy resin attain the required technical specs only after oven-drying for a certain time at temperatures specified by the resin producer. For this purpose, prior to the finishing, the completed boats are post cured. SP Systems Ampreg 22 epoxy resin utilized by M.A.T. was cured at 50 degrees for 16 hours.

These interesting and race-oriented boats were equipped at Izmir Levent Marina. I happened to witness the delivery and trials of the sails produced by Tursan North Sails. The boats are quite a marvel. Even though we were five people onboard, the boat took only a few seconds to reach 5 knots when leaving the marina, just using the jib. Sailing with spinnaker in Atlantic onboard this boat amidst large waves would most probably be a thrill.

You can read more about the race and the Mini class on <u>www.minitransat.com</u> and <u>www.classemini.com</u>. We wish every success and good luck to fellow yachters from Israel. It is a very fact that Turkey is a part of such high-profile international races.