

## Full Batten Main

From time to time there is a discussion between Amelians about full batten main and mizzen sails. We follow these discussions with great interest. But never we saw any comment of an experienced sailmaker. Therefore in 2021 we decided to ask Jens Nickel. Jens is a well known German sailmaker (Segelwerkstatt Stade) with excellent reputation. We think his answer is of general interest. Here our "free" translation of his statement originally written in German:

"A furling mainsail without battens is simply crap. The upper 18 to 20% of the sail only create drag (resistance) and no lift/buoyancy (more heeling, more rudder pressure, less speed).

A mainsail with short vertical battens is already better, but the leech rounding is still limited, which mitigates the points described above but does not really cancel them out. Furthermore the short battens have no reefing function (see below). The main reason against short battens however is that they can get jammed in the mast on the starboard inner mast edge (when, as usual, furled anti-clockwise). This does not happen often, but when it does you have a real problem.



The unreefed furling mainsail of MAGO DEL SUR in December 2023 on the way from La Palma to La Gomera. It is easy to see that all battens lead to the foot. The foot is cut slightly upwards. You can recognise from the colour of the sails that they have been used for a few years, also in „sandy“ areas.

The only argument against full battening is the higher price. These sails produce more propulsion, less heeling, less rudder pressure. Furthermore, the battens are perfect reefing steps. The battens are not parallel to the luff, but slightly slanted. Reefing should now always be done in such a way that the batten is always completely furled into the mast. It then winds itself slightly around the foil in the mast as a spiral and thus stretches the "new luff" a little.

After more than 25 years of producing fully battened furling mainsails we have never had one owner who was not satisfied with the conversion.”

### **Mago del Sur in 2016**

When we got our Amel 54 in 2016, the short battens of main and mizzen were missing. (The 54 was the first and only Amel which was fitted with short battens on main and mizzen.) The previous owner had probably removed them during his circumnavigation and we have no idea how long he sailed his BRONWYN without battens.

After purchasing the boat the transfer trip was on the agenda. We got new short battens made by a local sailmaker in Lymington. As he couldn't get the fibreglas material for flat profiles and we were in a hurry, the new battens were cut of round material. We lost all but one in the first few hours of the transfer trip. 😞 We didn't notice the loss in the beginning due to the rough conditions.

With the loss of the battens, we constantly had a strong flapping of the leeches that we could not stop, no matter how we trimmed main and mizzen. Somehow strange: The performance of the boat was still surprisingly good, but it was annoying for the crew.

Arriving in Bremerhaven, Germany, some days after easter 2016 we decided to replace the sails.



MAGO DEL SUR in August 2018, slightly blurred in rough seas on the Baltic Sea. Not easy to recognise: The main is reefed by one batten and the mizzen by two. (Foto: Manfred, SY FATU IVA)

### **Full batten sails on Amel 54 Mago del Sur and their characteristics**

In July 2016 we ordered new genoa, jib, full battened main and full battened mizzen from Jens Nickel, Segelwerkstatt Stade. Since then we never had any problem to furl in or out main and mizzen. We can do it on all angles to the apparent wind and we could do it in all wind speeds we have met until now. The furling systems never blocked. Meanwhile we sail the full batten sails some seven years without any problems.

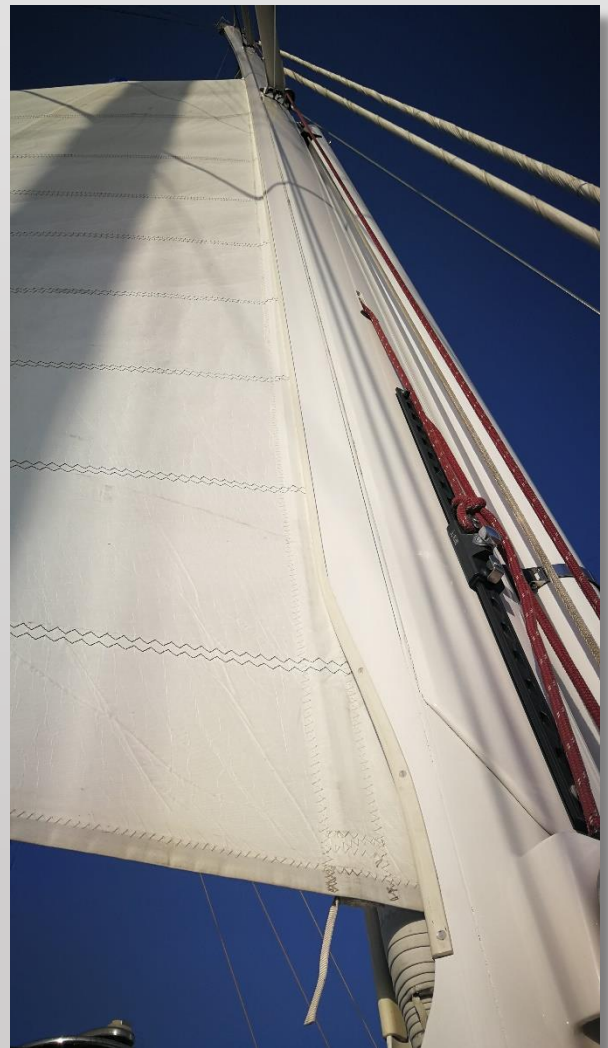
## Characteristics

- The battens are not really vertical or parallel to the sluff but arranged at a slight angle (slightly slanted). This means that the upper end of the batten enters the mast slot first, then the batten follows in a very slight spiral. As a result, the sail can be reefed and the sail foot can be well adjusted by the outhaul. Each batten serves as a reefing step.
- All battens finish at the sail's foot
- Slightly ascending cut of the foot. This means that the sail is not as bulky in this area when furled in completely.
- The battens consist of two materials: glass fibre elements and carbon elements in the upper area to keep the aft part of the sail's stiff.
- Diameter of the round battens: 10 mm
- The individual parts of the battens are screwed together
- The lower end of each batten is not round, but flat and wide (prevents the battens from slipping out of the batten pockets)
- The sails have a triradial cut.

But there is one aspect you have to know if you think about a full batten sail. The connection between halyard and sail has to be reliable. Once it happened that a boatyard fitted our main to the mast with using a so called "Flamish Eye" (Flämisches Auge) which was added at the end of the halyard. This eye was to fix a pilotline but not to connect sail and halyard. I insisted to change it but I forgot to proof the connection after the main mast was set on the boat. After 3 hours of sailing the main came down - more or less *half way* - creating an interesting S-shaped new sail design because the battens blocked the rest of its way down. It was quite a nice job to get the battens out of their pockets piece by piece ... Finally we managed it to get the sail down.

### **Summary: Advantages versus disadvantages of battened mast furling sails**

- + more drive force, more speed
- + less heeling
- + less rudder force
- + the battens are perfect reefing steps
- + easy to furl in and out
- + easy to reef and unreef on all directions to the apparent wind
- more expensive
- difficult to recover if the halyard or halyard fixing breaks



The slight inclination of the battens is clearly visible. The top of the batten enters into the mast groove first. Easy to see that the sail foot rises when furled in.

### Full batten sails on other Amels

We now of some **Amel 54** equipped with full batten main and mizzen. During the last weeks a friend of us, sailing a 54 too ordered full batten sails at Segelwerkstatt Stade. This company now is run by Jens son Morton.

In 2011 Martin Knauff, owner of **Super Maramu** STENELLA ordered full batten sails by German sailmaker Beilken. He reported that he never had any problems with this sails.

### How to handle full batten sails?

When we first set the mainsail in or immediately beyond the harbour, we go upwind if the conditions allow. If this is not possible, we stay on the course we are currently steering.

#### Setting the main:

- Boom more or less amidships
- Mainsheet with a little slack
- Move foil a few turns (in our case clockwise)
- Pull tight the sail with outhaul
- furl out the foil a few turns again
- tighten sail with outhaul again
- repeat this steps until the sail is in the desired position
- now set course if needed, adjust the sheet (and the boom) according to the apparent wind.

We do this process in small steps to ensure that the sail does not compress in the mast when the foil is turned. It is easy to see that the manouver is more or less the same like using the standard DEME-sails of an 54.



The mainsail clew on MAGO DEL SUR. Only lashed. The ball-bearing traveller of the outhaul is not visible, only the eye for the lashing. The outhaul line is guided over the reel on the boom nock.

### **Furling in:**

- Boom unchanged to steering course
- Sheet unchanged
- Loosen the outhaul slightly
- Turn the foil a few turns (anti-clockwise) until there is more or less no more play in the sail (the amount of play we accept corresponds to the apparent wind strength: the more wind the more play)
- Slightly loosen the outhaul again
- Turn the foil a few turns again
- Repeat until the sail is half furled
- now both foil and outhaul normally can be used parallel and without interruption until the sail is furled in completely. If the latter seems to difficult, proceed in small steps until the sail is furled in completely
- Now fix the boom amidships.

Note: Of course, you can also set an upwind course if the conditions allow this.

### **Reef in:**

As furling in until the desired reefing level is reached.

The sail is correctly positioned in the reef when the vertical batten has just disappeared completely into the mast.

Note: Each of the vertical battens corresponds to a reefing step. Our main therefore has 5 reefing steps. The sail is correctly positioned in the respective reef when the vertical batten has just disappeared completely into the mast.



This also works: double butterfly. Here genoa to port, main to starboard, mizzen sheeted like the genoa on the port side.

### Furlout a reef:

- Maintain course
- Tighten the boom on an upwind course but keep your course. This prevents the leech from getting caught in the upper shroud when sailing downwind or reaching.
- Turn the foil a few turns clockwise
- Pull sail tight with the outhaul
- Repeat the process as required until the desired reefing level is reached or the sail is fully unreefed.

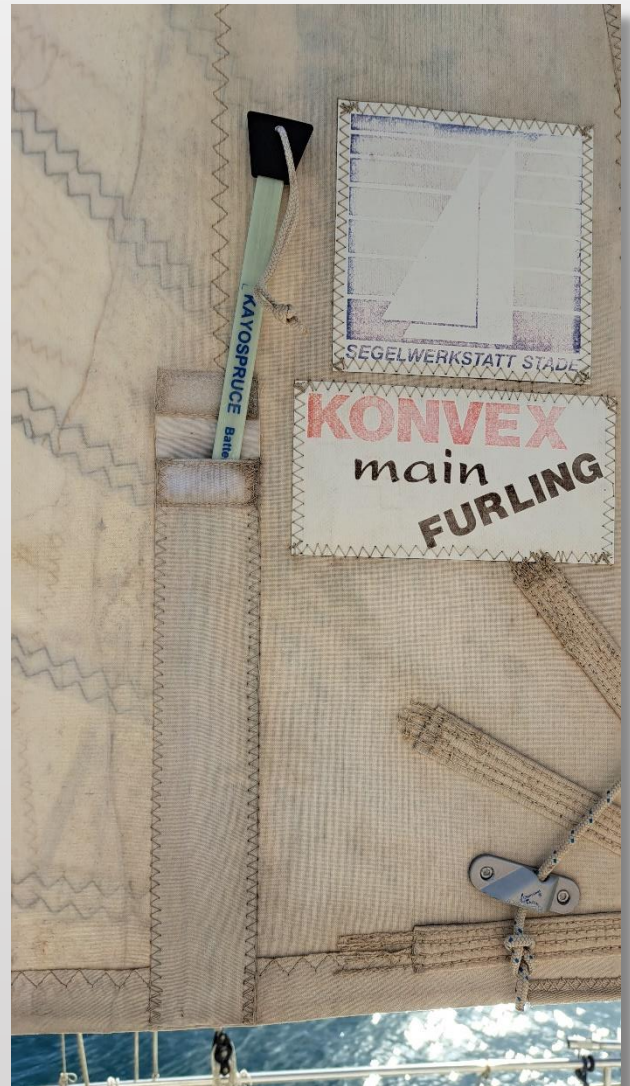
Note: When unreefing, especially during the last few turns of the foil, make sure that the sails leech and the first batten is not caught behind the upper shroud. If this happens, furl in some turns, tighten the boom and try again.

Adjust the sheet (and the boom) according the course to the wind.

All this was checked for correctness by the admiralty. 😊

San Sebastian de La Gomera, 26.01.2024

Martin Birkhoff



One final detail: Close to the clew of the mainsail there is a small pocket in which a "stuffing tool" for the batten pockets is stored.



Line ending as a flamish eye (Flämisches Auge). I do not know another term for this. You can fix a pilot line in this eye but it is not designed to carry heavy loads.