

Formula Kite

2024 Equipment Registration Cycle

Kite Size Measurement

The kite area will be determined “flat”, that means laid out on the floor with defined tension applied. Measurement processes widely follow similar procedures by FAI for paragliders.

The most accurate and reproduceable measurement method is photogrammetry with a repeatable accuracy of 0.1m².

It is important to note that the maximum kite size (21.00m² for men and 19.00 m² for women) is an absolute value for which no “upper” tolerance applies. The average value is therefore expected to be the maximum size minus the allowed tolerance of 0.5%

With regard to production tolerances, these will likely defined as in the previous quad (+/- 2mm or +/- 1% whichever is greater) except for the span measurements which likely will be capped at +/- 0.5%.

For the Large kite size range this means that the average area, including the measurement accuracy, is expected to be no more than 20.8m² for men and 18.8m² for women.

Instructions for kite area measurement

Setup

- a. Kite laid out flat on the floor, bottom side up, on a contrasting surface (this helps the accuracy of the photogrammetry software).



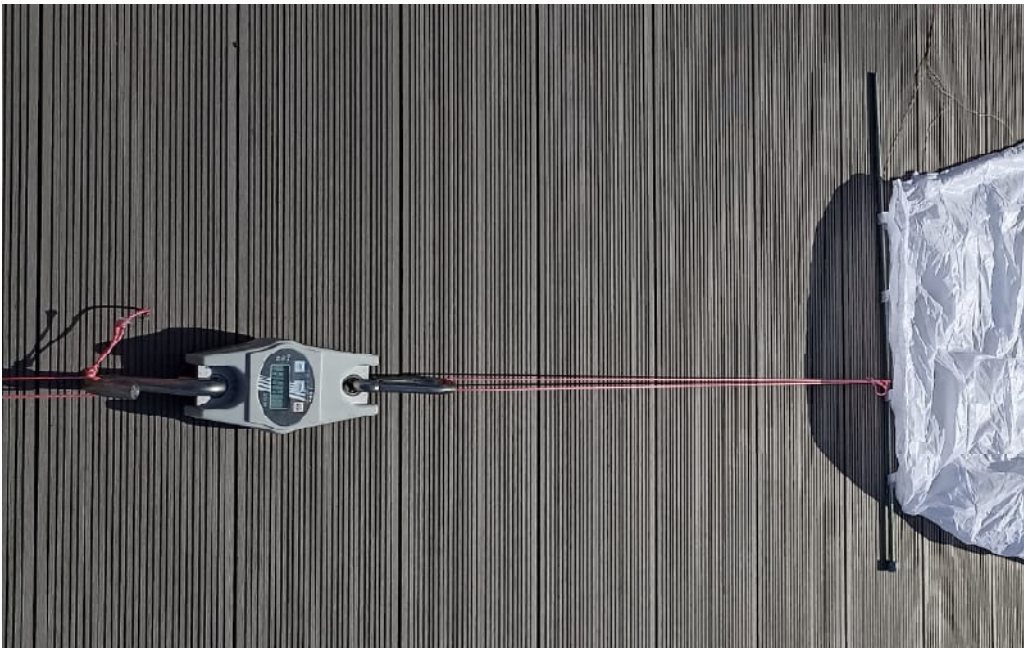
- b. Apply hooks on the bridle attachment points closest to each tip.
- c. Connect hooks to a non-bending rod.



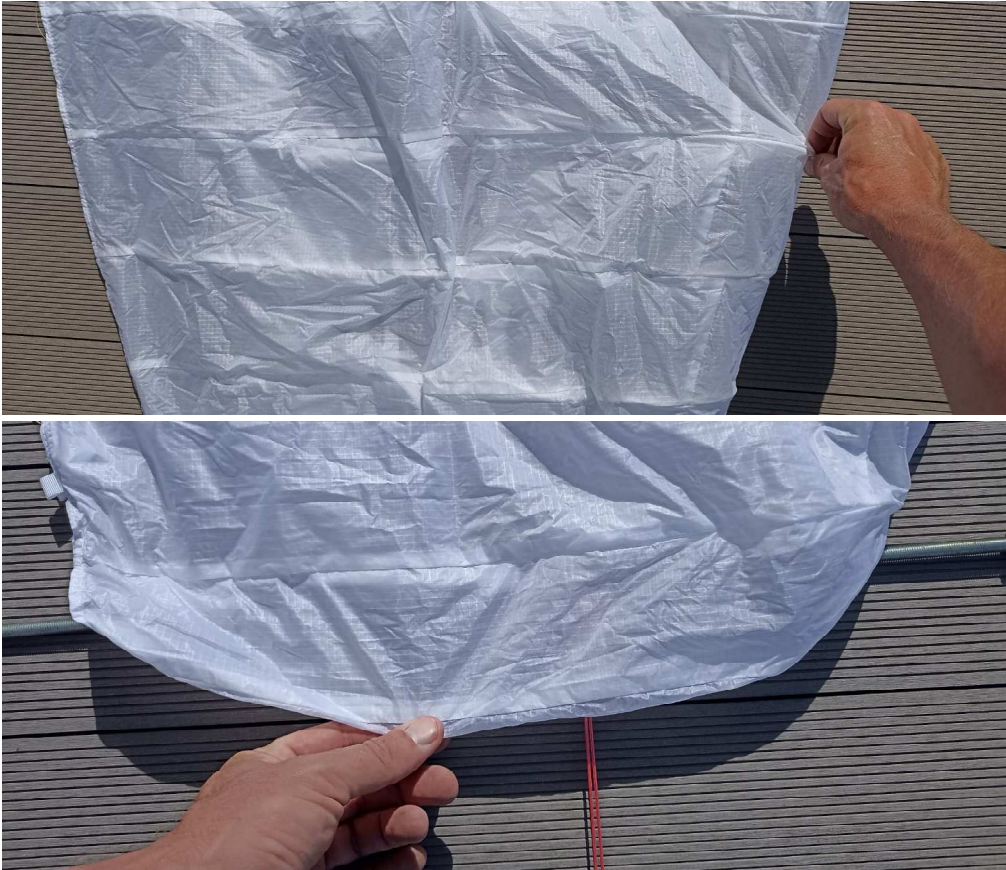
- d. Fix the rod on one side on the ground.



- e. Apply 5kg load on the other side



- f. Stretch out any obvious wrinkles and flatten the last cell on the tips if required.



Data Collection

- g. Data is collected with a drone. Ideally with a longer focal length (i.e. Mavic 3 Pro with 3x zoom camera), alternatively with a wide angle camera (Mavic Mini 3 etc) however this requires more pictures.
- h. Minimum 20 pictures should be taken straight overhead with an overlapping pattern (min. 80% picture overlap).
- i. Minimum 5 pictures should be taken from each side (leading edge, trailing edge), circling around the kite, also with 80% overlap.
- j. Minimum resolution 12MP (better 20/48 MP)

Data Processing

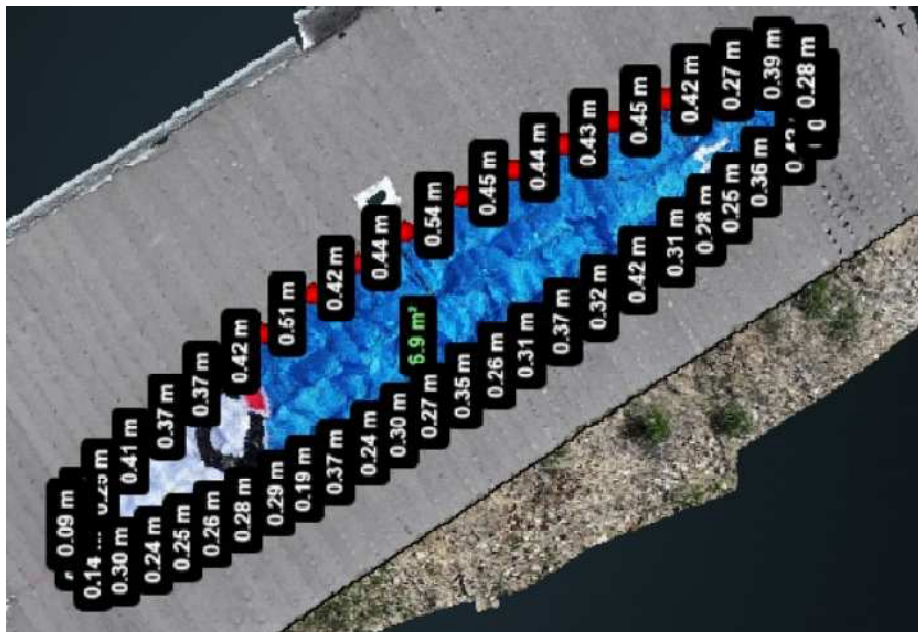
- k. The software used is WebODM in the most recent version (at the time of writing this document this is 2.1.2 build 101).
- l. Import the pictures taken in step 2
- m. Computing settings:
 - High Resolution
 - Resize Images: no
 - dem-resolution: 0.1
 - feature-quality: high
 - orthophoto-resolution: 0.1
 - pc-quality: high

- n. This should result in approx. resolution of 2mm and a computing time of approx. 1 hour (depending on the computer)

Data Analysis

- o. View 3D model
- p. Textured Model: Check Show Model
- q. Camera Pojection: Perspective
- r. Select Top View
- s. Select Earth Control
- t. Zoom to full screen
- u. Use Area Measurement Tool to start initial measurement (right click to end)
- v. Zoom in to adjust outline points.

Example for Untextured Model (Low Resolution)



Example for Textured Model (High Resolution)

