

FOILING SuMoth CHALLENGE

2023 Foiling SuMoth Challenge RULES v23r1.1

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ABBREVIATIONS

3R	Reduce Reuse Recycle
11HR	11th Hour Racing
CF	Carbon fiber
CFRP	Carbon fiber reinforced polymer
CAD	Computer Aided Design
CFD	Computational Fluid Dynamics
FEM	Finite Element Model
FSM	Foiling SuMoth
FW	Foiling Week
GFRP	Glass fiber reinforced polymer
IMCA	International Moth Class Association
LCA	Life Cycle Assessment
MS360	Marine Shift 360
SM\$	SuMoth dollars



1 GENERAL

1.1 Introduction

The Foiling SuMoth Challenge is a competition inspired by the need for more sustainable and efficient sailboat designs, along with coherent manufacturing methods.

The ultimate goal of this competition is to promote sustainable practices by challenging universities and higher education students in a friendly, technical, and athletic competition.

1.2 Concept

The constitutional goals of the **Foiling Week™** are to provide the foiling experience accessible to everyone, to generate an eco-social behavior, as well as to ensure the safety of the foiling community on the water. The Foiling SuMoth Challenge concept is in line with the three pillars of **The Foiling Week™** – **accessibility, sustainability and safety**.

1.2.1 Accessibility

One of the key aspects of the Foiling Week is to allow an inclusive and extensive experience to the sailing community and newcomers into the foiling world.

The Foiling SuMoth challenge allows students from all over the globe to participate in an innovative, sportive and challenging competition.

To allow an inclusive and equilibrated competition between teams, a *standardized manufacturing budget* system is applied to the manufacturing of each boat.

In a predominantly male-driven sport like sailing, female sailors in the foiling community are rare. To promote women's sailing, and sailing in countries that did not get represented on the [Olympic games](#), the scoring system of the Foiling SuMoth challenge is adapted following the rules on [Section 10.2](#).

1.2.2 Sustainability

Business models in shipyards and naval industry are oriented towards the economic benefit of the production, often choosing cheaper labor locations along with weak environmental regulations to generate a larger income. Such choices result in negative social and environmental impacts.

The Foiling SuMoth challenge organization believes that a student competition is a great opportunity to have raw and creative ideas. Future naval architects and engineers will be a key factor to change the economic driven approach.

To reverse such “business as usual” practices, the Foiling SuMoth aims is to look towards the **“3R”** concept of – **Reduce Reuse Recycle** - as well as the three aspects of sustainability.



A sustainable practice can be defined as a balance between environmental, social and economic performances.

- **Environmental**

The Foiling SuMoTh boats are meant to be designed and manufactured with a focus in low-carbon emission practices, where the use of bio-based materials as well as recycling and upcycling obsolete elements is encouraged.

- **Social**

The Foiling SuMoTh challenges the teams to make a reflection about the social impacts along the production chain of the materials used for the design and manufacturing phases of the boats.

- **Economic**

The Foiling SuMoTh must comply with the manufacturing budget and standardized costs. The manufacturing budget was created for two reasons: to limit the manufacturing spending and to have an equilibrated competition.

With these three key elements in mind, the *Foiling SuMoTh* concept aims to enhance the sensibility towards more sustainable innovative designs and manufacturing methods to be applied on foiling high efficiency sailboats.

1.2.3 Safety

The SuMoTh participating teams should consider the sailing environment and be aware of the importance of safety in high speed sailing. Foiling brought a new generation of sailing boats that can reach high speeds and with it the increased risk of accidents and injuries. The degree of consciousness for safety and security should be higher than ever before in the history of sailing boats.

1.2.4 Sustainable Development Goals (SDGs)

The SuMoTh Challenge involves the [United Nations \(UN\) global goals for sustainability](https://www.un.org/sustainabledevelopment/).





1.3 Concept application

The *Foiling SuMoth* concept is applied as a three (3) stage competition where; **boat design**, boat **manufacturing & performance** as well as **racing** are evaluated.

The stages are correlated, meaning that the first stage “S1” (Stage #1) needs to be completed before engaging on the second stage “S2”. There is no obligation to engage into a subsequent stage. The general description is defined as follows:

1.3.1 S1 - Design

This stage is fully conceptual. The teams engaged at this stage will create a SuMoth concept complying to the requirements on the budget and produce a report.

1.3.2 S2 - Manufacturing & Performance

While the ultimate goal of the SuMoth Challenge is to compare the concepts on a racecourse, this might not suit all schedules or teams' capabilities to travel.

The S2 stage is a “standalone” competition where each team will test and record their performance on the water on a defined weather conditions range.

1.3.3 S3 - Racing

The racing stage is the ultimate goal of the SuMoth Challenge. The teams will meet to test their boats against each other.



2 PARTICIPATING TEAMS

The Foiling SuMoth Challenge is open to all students from any school, university or association and from any grade, with the ability of designing, building and/or sailing their own concept safely. The registration and participation does not involve any fees.

All communications between the teams and the Organization will be exclusively made via the *Discord Server*. **It is each teams' responsibility to be active on the communication platform to remain informed of all news and relevant information. Access to the platform will be granted to all members once the registration is completed.** The registration form is available on the "Rules" section on the [SuMoth competition website](#).

2.1 Teams requirements

The teams willing to compete in the Foiling SuMoth Challenge event:

- Shall be fully composed by students, with the exception of the team manager. with no restriction on the career or degree.
- School alumni, graduated the year prior to the competition and who were involved in the process are allowed to integrate the team.
- Shall have a "S3" competition team of up to 10 students, with no restrictions on the number of team members on the design and manufacturing process.

2.2 Team roles

Teams must assign four (4) roles by the time of the registration, being: Team Manager, Team Captain, Logistics Officer and Communications Officer. The Team Co-Captain role is optional. Each person can occupy a maximum of two (2) roles. The Team Captain can only be responsible for a single role.

Please refer to "APPENDIX A – Team structure example".

2.2.1 Team Manager

The Team Manager must be formally related to the institution or association (i.e. Teacher, Professor, Assistant, Postdoc, Association president, etc.). The Team Manager will be responsible for the students involved in the project during the design, manufacturing and competition phases, remaining the maximum authority towards the organization.

2.2.2 Captain

The team Captain must be a student. This person will be in charge of the team, remaining the main contact point with the event organization.

The Captain will be responsible to provide the Technical Report and Presentations needed to evaluate the presented concepts.

In the case of multiple Foiling SuMoth concept boats in the same team, each Concept must have one dedicated Captain with the possibility of sharing the Logistics and Communication officers as well as the skippers.



2.2.3 Team Co-Captain (optional)

While not mandatory, the Team Co-Captain (if any) will share the responsibility of the team on specific aspects.

2.2.4 Logistics Officer

The Logistics Officer will be in charge of the arrangements of the team prior and during the competitions (accommodation, transportation, etc.). The person in charge will be in direct contact with the organization management.

2.2.5 Communication Officer

The main tasks of the Communication officer are to promote the teams' advancements and achievements during the design and manufacturing phases as well as during the competition.

2.2.6 Skippers

Skippers shall be registered prior to the respective S2 and S3 stages and can be changed at any stage and moment.

3 TECHNICAL REQUIREMENTS

3.1 General

To participate in the *Foiling SuMoTh Challenge*, boats shall meet all the technical requirements specified in this section.

3.2 IMCA box rule

All foiling SuMoTh concepts must meet the [IMCA](#) (International Moth Class Association) "box rule" specifications, as seen on Table 1.

Length	3.355 m
Beam	2.250 m
Maximum luff length	5.185 m
Maximum mast length	6.250 m
Hull weight	Unrestricted
Rigged weight	Unrestricted
Sail area	8.25 m ²
Restrictions	Multihulls/trapezes/movable seats/sailboards
Advertising	Category C (Unrestricted)

Table 1 IMCA box rules



3.3 Manufacturing budget

The Foiling SuMoth Concept must be designed and manufactured complying with the manufacturing budget, where the prices are evaluated in “SM\$” (SuMoth dollars).

This virtual currency is used to standardize the cost of materials for all participant teams. The manufacturing budget is capped to **10000 SM\$**, including all boat elements and spare parts to comply with the challenge rules.

The calculation of the manufacturing costs must be made with the help of the “Standardized Cost” tables on the STANDARDIZE COSTS section.

The use of the UFLP (Upcycled Foils Loan Program) will have an impact on the SM\$ budget. Refer to section 4.4.

3.4 Buoyancy

All boats shall remain unsinkable at all times and under all circumstances with greater buoyancy than its mass plus the skipper (85kg).

3.5 Manufacturing constraints

The SuMoth Challenge encourages the use of as little carbon fiber as possible in favor of more sustainable alternatives. Along with the IMCA geometrical restrictions, the following boat components will have limitations on the amount and source of carbon fiber contained in them, observed on Table 2.

	Hull Structure	Hull Wings	Main Vert.	Main Hor.	Rudder Vert.	Rudder Hor.	Rig	Other parts
Carbon Fiber (CF)*	5%	5%	50%	50%	50%	50%	100%	50%
Recycled CF	10%	20%	60%	60%	60%	60%	100%	60%
Upcycled CFRP	100%	100%	100%	100%	100%	100%	100%	100%

Table 2 Carbon fiber limitations

The calculations of the mass should be done by using the rules of mixtures and considering the pre-process volume fractions. Stacking information (size, weight, material, etc) as applied on the mould must be taken into account, and not the trimmed projected surface. A supporting document to generate the calculations and obtain the CF allowances is accessible on [SuMoth Manufacturing Calculations spreadsheet](#).

Teams should provide an as-built weight breakdown of the hull, foils and verticals including fiber, resin, core and resin uptake (absorption estimations) and other materials used.

Where carbon fiber is absolutely required, the SuMoth Challenge encourages teams to manufacture components in-house using recycled and upcycled materials, defined as:

- Upcycled: the material is reused in its current state.
- Recycled: the material must be broken down and processed before reuse.



3.6 Electronics and sailor assistance

Data acquisition and measuring systems are allowed at all times. In the case of battery powered electronics, the compartments used for this purpose must remain fully waterproof (i.e. IP67) and firmly fixed to the boat.

4 STANDARDIZED COSTS (SM\$) & HANDICAP

The standardized cost tables define the price in “SM\$” (SuMoTh dollars) that the materials used for the manufacturing cost for the competition evaluation.

In the table, the eco-friendliest materials have a cheaper SM\$ cost, than those considered less sustainable.

All bio materials, such as natural woods (i.e. Balsa Wood, Paulownia), have **0 SM\$** cost.

4.1 Manufacturing raw materials and processes

The materials and processes types and related standardized costs can be found on the [Google Sheets document on this Link](#).

If a material is not present in the document, the team shall contact the organization via the dedicated [SuMoTh Discord Server](#) to assign a cost and add it to the document.

4.2 Blocks, tacks and pulleys

The cost of these elements in SM\$ will be considered equivalent to the standard manufacturer's suggested retail price (MSRP) costs in US\$ (excluding taxes and shipping). The value of each element needs to be provided in the Technical Report as per manufacturing standard prices.

4.3 Recycled elements and materials

4.3.1 *Obsolete artifacts and boats (upcycling)*

The use of upcycled elements from old obsolete or broken artifacts (i.e. Lowrider IMCA, recycled boats or parts, etc.) is allowed and will have a 0 SM\$ cost in the budget calculation.

Every element coming from an obsolete artifact must be itemized with the origin description and the transformation involved (Stage S1 Report).

The materials used to turn an obsolete part into a Foiling SuMoTh part must be itemized in the manufacturing budget calculations (i.e. repair on broken mast).

If a “classic” IMCA boat (or other class) hull or part is used, the team shall make sure that this part does not belong to the history of such class and, as such, has historical value.

4.3.2 *Recycled materials*

- **Industrial excess**

The use of materials coming from industry excess is allowed and encouraged. The budget cost of such material will have a 25% reduction in the cost calculation.



- **Out of shelf life**

In the case of using out of shelf life materials (i.e. prepreg, epoxy, etc.) these materials will have a reduction of 50% in the cost calculation.

4.3.3 Used parts (Rig elements and foils)

Used IMCA boat parts are allowed, SM\$ budget and handicap impact applies:

		Year of production					SM\$ Cost
		Pre 2015	2015	2016	2017	Post 2017	
Foils	Main Vertical	-20	-22	-24	-26	-50	1500 SM\$
	Main Horizontal	-15	-17	-19	-21	-30	500 SM\$
	Rudder Vertical	-15	-17	-19	-21	-30	1500 SM\$
	Rudder Horizontal	-10	-12	-16	-18	-20	500 SM\$
Rig	Sail	0	-5	-10	-15	-20	0 SM\$
	Mast	0	-5	-10	-15	-20	0 SM\$
	Boom	0	-5	-10	-15	-20	0 SM\$
	Spreader	0	-5	-10	-15	-20	0 SM\$

Table 3 Handicap points on non Upcycled Foil Loan Program elements and SM\$ Cost

4.4 Upcycled Foils Loan Program (UFLP): Upcycled industrial Hydrofoils

New teams, registering for the first time to the Foiling SuMoth Challenge, could access the UFLP for the year of the registration. This program will allow the new team, willing to compete in S2 and S3 to focus on the design and manufacturing of the hull structure and its components (foil cassette, gantry, wingbars, wand, etc), ensuring its functionality and reliability.

4.4.1 Handicap system

The use of hydrofoils from the UFLP will have an impact in the Dynamic stages (S2 and S3) depending on the number of elements used (Main Vertical, Main Horizontal, Rudder Vertical, Rudder Horizontal), refer to APPENDIX C. The handicap applies to every sub-stage.

4.4.2 SuMoth \$ Budget impact

The use of parts from the UFLP will have an impact on the budget depending on the part.

4.4.3 Loan period

The use of parts from the UFLP are of one SuMoth Challenge period. A team can loan a part for one participation only. The parts shall be returned in the same or better condition than it was received.

4.4.4 UFLP Responsibilities

The UFLP parts belong to the FSMC organization and it is the full responsibility of the team receiving them to make use in the best possible way. In the case of breakage under normal use of the parts, the team is responsible to repair to the highest possible standard to return the parts to the organization and make it available to the following teams.

4.4.5 Shipping & Costs

The shipping of the parts will be in charge of the team requesting the parts, to obtain and to return them, if any.



5 “S1” STAGE - Design

The design stage of the SuMoTh Challenge is the cornerstone of all concepts. At this stage, each team will develop their unique design respecting the “TECHNICAL REQUIREMENTS” of the competition. The evaluation will be done on the following deliverables:

5.1 Foiling SuMoTh S1 report

The “Foiling SuMoTh S1 report” is the Technical Report on which the Jury will evaluate all the concepts. Each competing team will submit theirs by email or Slack before the deadlines of each event:

- Foiling SuMoTh Challenge 2023 S1 deadline: **May 21st 2023**

The report will have a maximum of 40 pages and present the design and manufacturing specifics of the boats. Including the sustainability path, the manufacturing of the parts. The report shall be done using the “2023 SuMoTh Challenge S1 Report Template” on its latest version. The report include the three main sections and required subsections:

- **Engineering and Design**
This section will provide the analysis made by the team to achieve their Foiling SuMoTh concept, their calculations and results, from conceptual drawings to any form of CAD, FEM and CFD.
- **Manufacturing and cost analysis**
Within the limits of the “Manufacturing Constraints”, each team will provide a detailed analysis of their path to manufacture their concept. From first use materials to recycled ones to upcycled obsolete elements.
The cost analysis, following the “Standardized Cost” must be provided in a chart.
- **Sustainability analysis**
In this section, the team will provide a Life Cycle Assessment (LCA) of the materials and elements used in the manufacturing of their boat, made with **MarineShift360 LCA Tool**. From the molds to the final parts, this section will justify the choices made to achieve the concept with a sustainability approach.
Team members in charge of sustainability are required to attend all webinars proposed by MS360. Specific questions related to the LCA shall be posted on the #lca channel in the [SuMoTh Discord Server](#).

5.2 S1 Design VLOG

Along with the report, a 3 to 5 minutes video will be delivered containing the key elements of the concept, from the innovations to the sustainability aspects.

5.3 Project vulgarization & popular vote

From the FSMC 2022, the S1 stage will assign **50 points** (from a total of 500) to the team obtaining the most votes from the public.

One month prior to the S1 report submission deadline (May 21st 2023) each team will provide a 1 page (A4) **PDF AND WORD (.doc)** summary of the project and a 60 seconds (+/- 15 seconds) video teaser.



6 “S2” STAGE - Manufacturing and performance testing

This stage is where the magic happens! Based on the Stage 1 (S1) ideas and engineering, the teams will proceed to manufacture their SuMoth concepts with innovative sustainable materials and methods.

During the “Manufacturing”, all processes and their respective variables (time, materials, results) will be registered to include in the **“S2 Manufacturing Report”**. Alongside these elements, a Marine Shift 360 LCA analysis will be provided.

The “Performance” element of this stage can be achieved both at home during the year, allowing the teams to test and record their best runs at any given time, or during the Foiling SuMoth Challenge, prior to Stage 3 (S3).

6.1 Teams evaluation request

Following the testing schedule, a team will request for the “S2” evaluation. This process will be accepted upon receipt of at least a video proof of the boat sailing steady and under control (specifications TBD).

6.2 Boat measurements

The SuMoth concepts, fully finished, will be measured by a local IMCA measurer at the team base for dimensional compliance with the class and safety.

6.3 Performance testing

Once approved by the measurers, the teams will have a period to record their performance with a GPS tracker (provided by the organization). Each team will have unlimited test runs up until the end of the period. The best runs will be then collected and compared against all other teams.

6.3.1 Course specifications

A “run” consists of a 2 minute maximum path that:

- 1) Starts from an archimedean mode (non foiling), any chosen direction
- 2) Foils into a maneuver (tack or gybe)
- 3) Finishes the performance with at least the 20 last seconds on the foils.

A diagram of the course can be found on APPENDIX D.

6.3.2 Course evaluation

The average speed will be calculated from:

- The 0m/s (zero meters per second) archimedean state ($t_0 = 0s$)
- To a maximum time of 120 seconds ($t_f = 120s$)



6.4 Performance showcasing

A video of at least 3 performance runs (5 to 7 minutes), showcasing the SuMoTh concept shall be delivered.

6.5 Manufacturing report

To complement the “S1” stage, a manufacturing report shall be delivered, showing how the boat was manufactured, the methods used and the deviation from the original Design on the previous stage.

6.6 “S2” during the FSM event

If a team is joining the Foiling SuMoTh event, the elements on 6.2, 6.3 and 6.4 can be achieved during the event.

6.7 S2 diary VLOG

A storyline of the teams’ path to the S2 stage. Containing at least

- Manufacturing phases
- Assembly and fitting
- Sailors preparation, and the road to the big day!
- Testing prior to S2 performance testings

7 “S3” STAGE - Racing

This stage will be split in two, being “Speed test” and “Course Racing”. The speed test will be a downwind slalom course followed by an upwind where two boats will be racing against each other. The course racing will be a fleet governed as per IMCA, event or club rules.

7.1 Fleet racing

The fleet racing regatta will be governed by the international rules of sailing and courses will be held as per IMCA racing rules and course diagrams, with open Speed test.

7.2 S3 event Social Media diary

The Social Media diary during S3 shall include small clips, stories, clips and interviews with the team, other teams’ colleagues or visitors and spectators at the event.

8 COMMUNICATIONS AND SOCIAL MEDIA BLOGS

During the academic year, each participating team shall create **two** blog posts of 1650 words (or 3 single spaced pages). These blog posts will be sent to the SuMoTh organization via email to comms@sumoth.org or Discord on or before its due date, respectively.

Teams should provide PDF and Word files of their posts, as well as individual picture files in JPEG format.

These posts will be published on all social media channels and websites.



8.1 1st Blog post (due on February 15th 2023)

8.1.1 *Teams registered before the FSMC 2022*

- Team update (new members, organization, etc.)
- Challenges towards the S2 and S3 stages
- Short discussion about their previous experience (if any)
- Any other interesting information!

8.1.2 *Teams registered after the FSMC 2022*

- The global presentation of the team (i.e. team flag, background, etc.)
 - Motivation to participate in the SuMoth Challenge
 - Milestones towards the Foiling SuMoth Challenge
 - Objectives as a team and outcomes (including planning for S2 and S3)
- Note: If a team registers after the due date, the blog post shall be delivered one month after the registration date.**

8.2 2nd Blog post (due on May 1st 2023)

8.2.1 *Teams registered before the FSMC 2022*

- Ongoing work towards the Foiling SuMoth Challenge 2023
- Overall description and hints on the design
- Achieved milestones
- Readiness to competition, what does the team need to complete before the Challenge
- Sustainable choices applied

8.2.2 *Teams registered after the FSMC 2022*

- Overall description and hints on the S1 design
- Achieved milestones from the team
- Ongoing work towards the stages S2 and S3

8.3 Regular team progress and milestones

A monthly Social Media advancement reporting is required to showcase the achievement of the teams. At least **one monthly publication** must be done. The publications shall respect one of the following formats:

- Video: Between 1 minute and 3:30 minutes, with an interview.
- Text: format: 400 words and two images minimum

Publications must include the following:

- Mentions: @foilingsumoth @wearefoilingweek
- Hashtags: #sumothchallenge #foilingweek #wearefoilingweek

Please find the timeline spreadsheet version of the overall key dates and milestones.



9 QUALIFICATIONS, MEASUREMENTS AND SAFETY

Prior stages **S2** and **S3**, each boat shall be measured upon the box rules on Table 1 to comply with the IMCA. Once measured and complying with IMCA rules, the Foiling SuMoth boats will be allowed to race in the IMCA regattas (if all electronics are disengaged or removed) A structural and buoyancy examination will be made on each Foiling SuMoth concept boat to ensure safety for all participants.

10 COMPETITION & SCORING

The **Static phase**, composed by the “S1” Stage, is where the judges will evaluate the “on paper” technical attributes of each development. The **Dynamic phases**, composed of “S2” and “S3” stages, are where the sailors will compete in standalone and fleet races.

10.1 Scoring system

A total of 1000 points will be possible to obtain over the three stages as presented below, on Table 3.

A detailed table on positions and scoring is presented on APPENDIX B

S1 Stage (500 points)	S2 Stage (300 points)	S3 Stage (200 points)
<ul style="list-style-type: none">- Design Report (50 p.)- Presentation (50 p.)- Eco Design (100 p.)- Eng. Design (75 p.)- Innovation (75 p.)- Comms (75 p.)- Popular vote (50 p.)- Bonus points (25p.)	<ul style="list-style-type: none">- Performance (150p.)- Manuf. report (150p.)	<ul style="list-style-type: none">- Fleet racing (100 p.)- Fairplay (100 p.)

Table 3 Competition scoring

10.2 Fairplay points

The SuMoth Challenge is, first of all, a community of individuals pushing for a common objective. The competition format is used to push the limits and challenge each other to raise the bar on the sustainability and engineering aspects without forgetting to have as much fun as possible while respecting and helping each other. By default, all teams will be awarded the maximum points.

10.3 Points deduction (S2 & S3)

The full respect of the rules of conduct is mandatory. The non respect of such guidelines (i.e. respect of rigging and storage zones, use of PET bottles at the Event premises, etc) will result in a deduction of points.

10.4 Handicap & SM\$ budget impact (Stages S2 & S3)



To promote the self-built of all SuMoTh concepts parts, a Handicap system described on APPENDIX C is applied for those teams using external help.

10.5 Equality points (bonus points)

To encourage the participation of female sailors as well as those students coming from countries where sailing is not a common sport, “Equality points” will be awarded for both S3 phases. The points give will be:

1. **Female** = +15 points
2. **Student from non OG participation nation** = +15
3. **Points (1) and (2) combined** = +30 points
- 4.

10.6 Scientific Publications (bonus points)

To valorize the work achieved by the teams during the Challenge stages, additional points will be awarded to the teams submitting and publishing in the Journal of Sailing Technology (<https://onepetro.org/JST>)

1. **Submitted** = 10 points per article
2. **Accepted** = 20 points per article

The submissions must be of a high standard scientific publication. For the submitted and not accepted/reviewed papers will be evaluated by the Jury for points consideration. If a paper is accepted after the Stage 3 (S3) of the SuMoTh Challenge, the points will be added to the following year.

10.7 Venue

The venue for the SuMoTh Challenge “S3” stage will be held at:

Fraglia Vela Malcesine (FVM)
Via Gardesana 205
Frazione Navene – 37018
Malcesine, Italy

11 BOATS TRANSPORTATION TO EVENT

GAC Pindar is the Foiling Week official logistic provider. For the SuMoTh competition all teams will receive the most competitive quote which can include options for greener shipping solutions and carbon offsetting. Please contact the operations team at pindar@gac.com.



11.1 Schedule

The 2023 event will be held during 7 days of which:

PREP DAY 1	Measurement, Installation & Free sailing	June 26th 2023
PREP DAY 2	Measurement, Installation & Free sailing, S2	June 27th 2023
PREP DAY 3	Measurement, Installation & Free sailing, S2	June 28th 2023
Day 1	Event inauguration, S2, S3, S1 Pitch	June 29th 2023
Day 2	Measurements & S2	June 30th 2023
Day 3	Measurements and Qualifications, Speed Test Day 1	July 1st 2023
Day 4	S1 Presentation & S2	July 2nd 2023
Day 5	S2 and S3	July 3rd 2023
Day 6	S2 and S3	July 4th 2023
Day 7	Prize giving ceremony	July 5th 2023

12 GRANT ALLOCATIONS

Please refer to the “Foiling SuMoth Prizes, Awards, and Allocations” document.

13 EVENT

13.1 Event organization

The Foiling SuMoth event will be held within and during the Foiling Week.

The **3rd Foiling SuMoth Challenge** will be held during **Foiling Week Garda 2023 (June 26th to July 5th 2023)**.

13.2 Organizer

Foiling Week C.so di Porta Romana 63 20122 Milano, Italy	SuMoth Association Av. de Severy, 13 1004, Lausanne, Switzerland
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Contacts

Registration: registration@sumoth.org

Bruno Giuntoli, Foiling SuMoth Founder & Class President - bruno@sumoth.org



14 INSURANCE

Each participating boat shall be insured with valid third-party liability insurance with a minimum cover of €1.500.000 per incident or the equivalent in other currencies.

15 AWARDS AND PRIZES

Please refer to the “Foiling SuMoth Prizes, Awards, and Allocations” document.

16 CALCULATION EXAMPLE

The following example is an estimate calculation of a potential Foiling SuMoth, considering the “Standardize cost” tables. The calculation considers the real amounts used to produce the part, including scraps.

Consumables are not considered in the calculations of the manufacturing for this case.

16.1 Hull

The hull will be manufactured in a positive geometry using wood stringers and bulkheads with fiberglass/epoxy lamination and recycled PET core reinforcements, of which:

Item	Qty.	Cost in SM\$
Wood	8 kg	0
E-Glass	5kg	120
Bio-based Epoxy	6 kg	90
PET core	2 kg	30
Total		270

16.2 Appendages

16.2.1 Main foil and vertical

Item	Qty.	Cost in SM\$
Tooling board	20 kg	400
CNC machining	20 h	800
Dry fabric CF HM	2 kg	500
Bio-based Epoxy	2 kg	30
PET core	1 kg	15
Stainless accessories	0.5 kg	15
Total		1760



16.2.2 Rudder and vertical (same mold from main)

Item	Qty.	Cost in SM\$
Tooling board	10 kg	200
CNC machining	10 h	400
Dry fabric CF HM	2 kg	500
Bio-based Epoxy	2 kg	30
PET core	1 kg	15
Stainless accessories	0.5 kg	15
Total		1160

16.2.3 Trampoline

Item	Qty.	Cost in SM\$
Bamboo	10 m	0
Flax tow	40m	0
Std Mach2 tramp.	2	300 (USD)
Stainless accessories	2 kg	60
Total		360

16.3 Rig

16.3.1 Sail

Item	Qty.	Cost in SM\$
Used Mach 2 sail	1	500 (USD)
Total		500

16.3.2 Mast

Item	Qty.	Cost in SM\$
Alu conical mandrel	8 kg	80
Dry T800 CF	2 kg	400
Bio-based Epoxy	2 kg	30
Total		510

16.3.3 Boom

Item	Qty.	Cost in SM\$
PET core	1 kg	80
Dry T700 CF	1 kg	150
Bio-based Epoxy	2 kg	30
Total		260



16.3.4 Shrouds/stays/adjusters

Item	Qty.	Cost in SM\$
Stay	1	100 (USD)
Shrouds	2	200 (USD)
Adjusters	3	100 (USD)
<i>Total</i>		400

16.4 Control systems

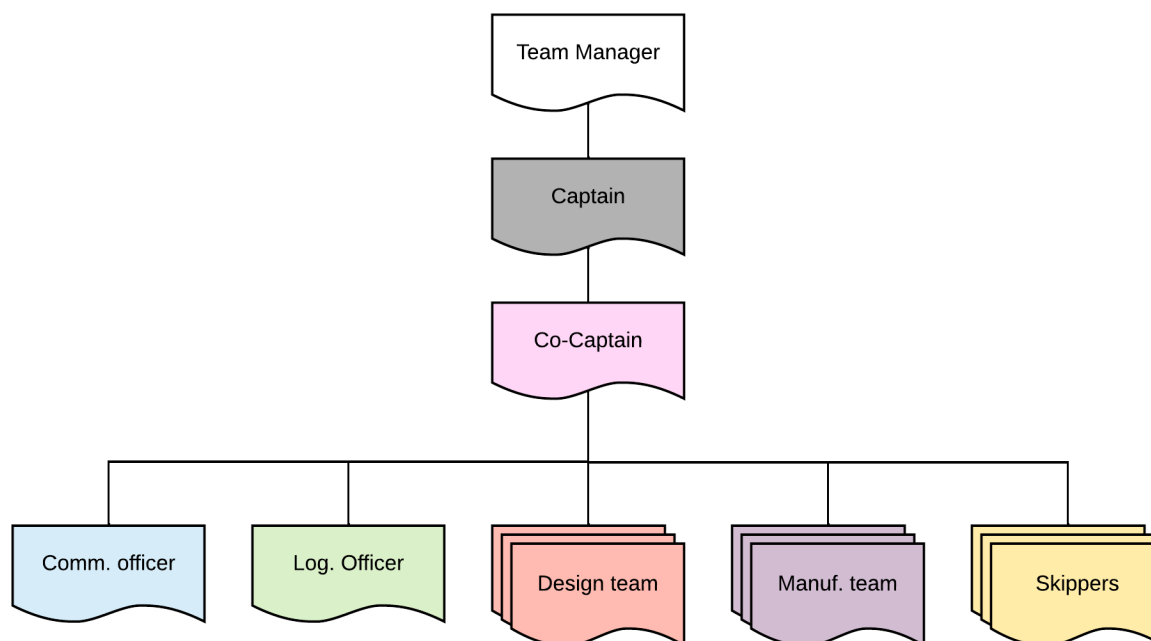
Item	Qty.	Cost in SM\$
Blocks	-	500
Tiller ext	1	100
Ropes/lines	-	200
Wand + ctrl. sys.	1	100
Total		900

16.5 TOTAL

Item	Cost in SM\$
Hull	270
Appendages	3280
Rig	1760
Control systems	900
Total	6210



17 APPENDIX A – Team structure example





18 APPENDIX B – Detailed Scoring System

The scoring system presented shows an estimate of the maximum possible points for every sub element.

Some categories will have a point impact on specific circumstances (i.e. late delivery, not up to standard, etc).

		Position							
Stage 1		#1	#2	#3	#4	#5	#6	#7	#8
Design Report	50	50	40	30	20	10	5	5	5
Presentation	50	50	40	30	20	10	5	5	5
Eng. Design	75	75	65	55	45	35	25	20	15
Innovation	75	75	65	55	45	35	25	20	15
Eco Design	100	100	80	60	40	20	10	10	10
Comms	75	75	65	55	45	35	25	20	15
Popular vote	50	50	40	30	20	10	10	10	10
Bonus points	25	75	65	55	45	35	25	20	15
Max pos. points.	500								

		Position							
Stage 2		#1	#2	#3	#4	#5	#6	#7	#8
Performance	150	100	90	80	70	60	50	40	30
Manuf. Report	150	100	90	80	70	60	50	40	30
Max pos. points.	300								

		Position							
Stage 3		#1	#2	#3	#4	#5	#6	#7	#8
Fleet Racing	100	100	90	80	70	60	50	40	30
Fairplay	100	-	-	-	-	-	-	-	-
Max pos. points.	200								



19 APPENDIX C – Handicap points

		Team-made					Upcycled Foil Loan Program
		In-house Built			Industry supported		
		Self-made 100%	Up(re)cycled	Industrial moulds	Self made moulds	Industrial moulds	
Hull	Main structure (internal)	0	5	-5	0	-10	NA
	Hull (shell/external)	0	10	-10	0	-20	NA
	Gantry	0	5	-5	0	-10	NA
	Bowsprit	0	5	-5	0	-10	NA
	Mast base & Bang	0	0	-5	0	-10	NA
Wings	Structure	0	5	-5	0	-10	NA
	Covers	0	5	NA	NA	NA	NA
Foils	Main Vertical	0	10	-10	0	-20	-20
	Main Horizontal	0	0	-5	0	-15	-15
	Rudder Vertical	0	5	-5	0	-15	-15
	Rudder Horizontal	0	0	-5	0	-10	-10
Rig	Sail	0	5	NA	NA	NA	NA
	Mast	0	5	-5	0	-20	NA
	Boom	0	5	-5	0	-20	NA
	Spreader	0	5	-5	0	-20	NA



20 APPENDIX D – STAGE 2 Course

