

NOVOTECH SRL
AEROSPACE ADVANCED TECHNOLOGY

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SEAGULL
GENERAL AIRCRAFT PRESENTATION

May 12, 2018

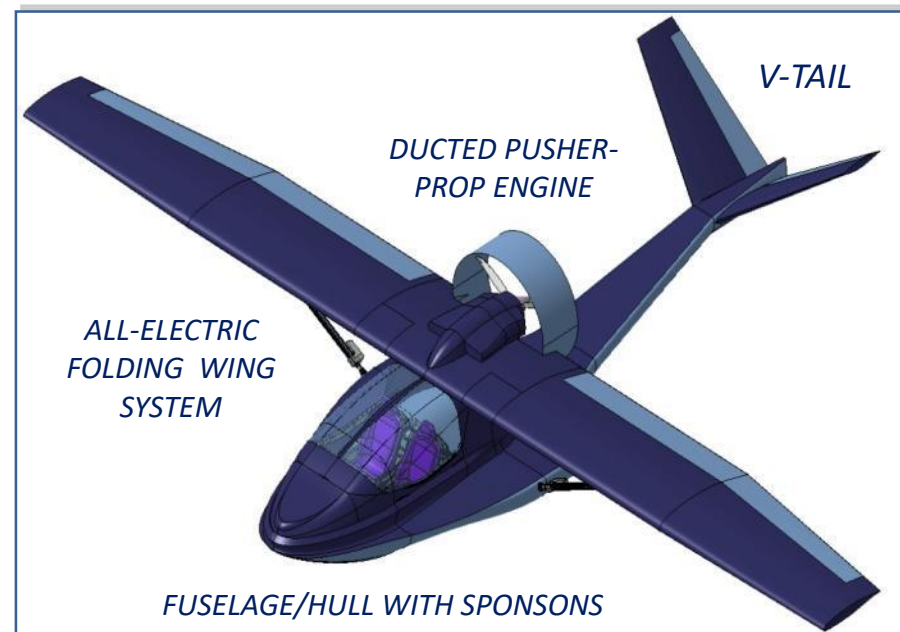
SEAGULL - The Marin-Air Vehicle for the Millennial Generation



The SEAGULL is a **breakthrough** with respect to the current transportation systems, a high performing **ultralight amphibian aircraft**, **easy** and **economical**, operating from any infrastructure in complete **autonomy**.

SEAGULL Main Characteristics

- Fully composite amphibious
- Braced wing (through linear actuators)
- Automated Folding wing allowing the usage:
 - as classical UL aircraft (no folded)
 - as sail boat (folded at 90°)
 - as ship or for ground transport and storage (fully folded aft)
- Single engine pusher configuration
- Ducted fan to ensure safety in water navigation
- Hybrid propulsion system (alternative)
- Retractable landing gear



Project partially **funded** by
MISE - Italian Ministry of the Economic
Development (Law 808/85)

Financing of **1.3M€** of which
55% to be returned

SEAGULL Aircraft - Operating Configurations



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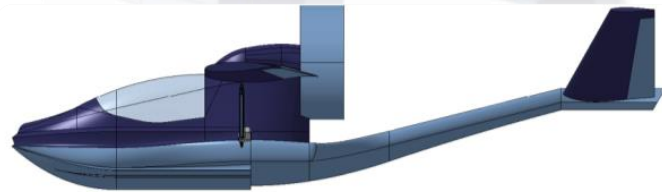
SEAGULL A/C in 5 words:

- ✓ UNIQUE
- ✓ INDEPENDENT
- ✓ YOUNG
- ✓ LIGHT
- ✓ ECO-FRIENDLY

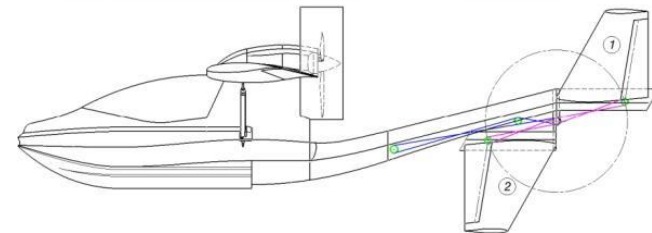
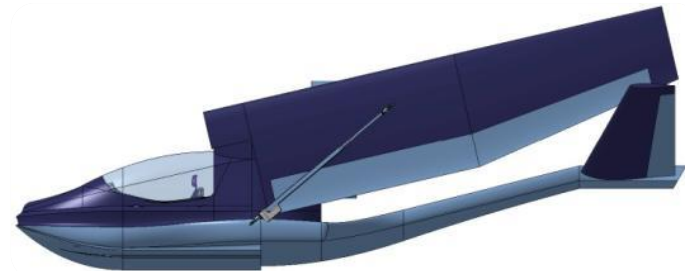
Ultralight Aircraft configuration



Sail configuration



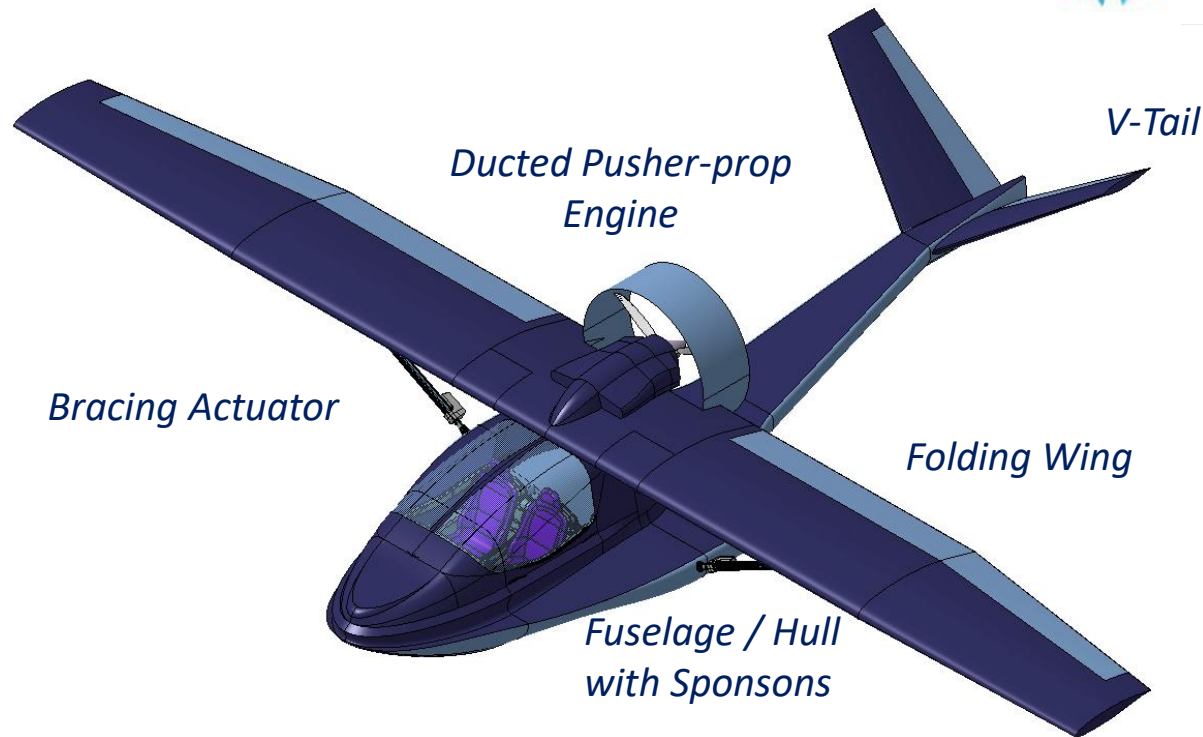
Ship and Mooring Configuration



SEAGULL Aircraft – General Characteristics and Dimensions



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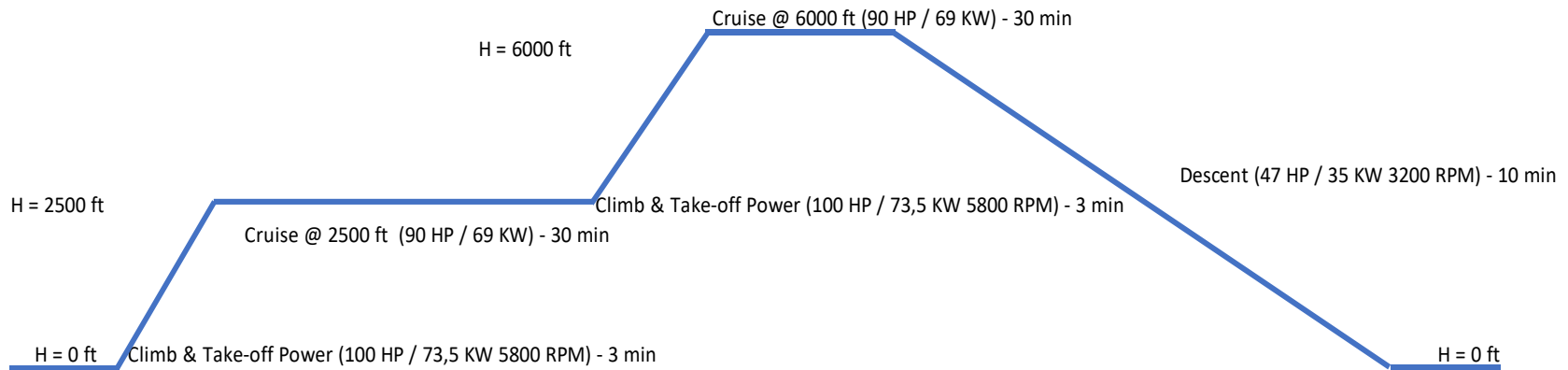
W_{TO} [Kg]	627.0
W_E [Kg]	397.0
S [m ²]	13.7
b [m]	11.5
AR	9.7
$L_{fuselage}$ [m]	7.4
H_{tail} [m]	2.4

V_s [KTS]	37.0 (70 km/h)
V_c [KTS]	92.0 (170 km/h)
H_{cruise} [ft]	6000
Max range	500 Km
Engine	Rotax 912 ULS Engine (baseline) Hybrid (alternative)
Propeller	Sensenich 3B0R5R68C 3 bladed 68"dia.

SEAGULL Aircraft – Basic Mission profile



The aircraft is mainly addressed to Sport and free-time utilization. The basic mission of the airplane can be defined as:



PHASE	ENGINE POWER* [kW]	RPM	Δt [min]
Take-off + climb (1+2)	73.5	5800 RPM	3
Cruise @2500 ft(3)	69.0	5500 RPM	30
Climb(4)	73.5	5800 RPM	3
Cruise @6000 ft(5)	69.0	5500 RPM	30
Descent and landing (6)	35.0	3200 RPM	10

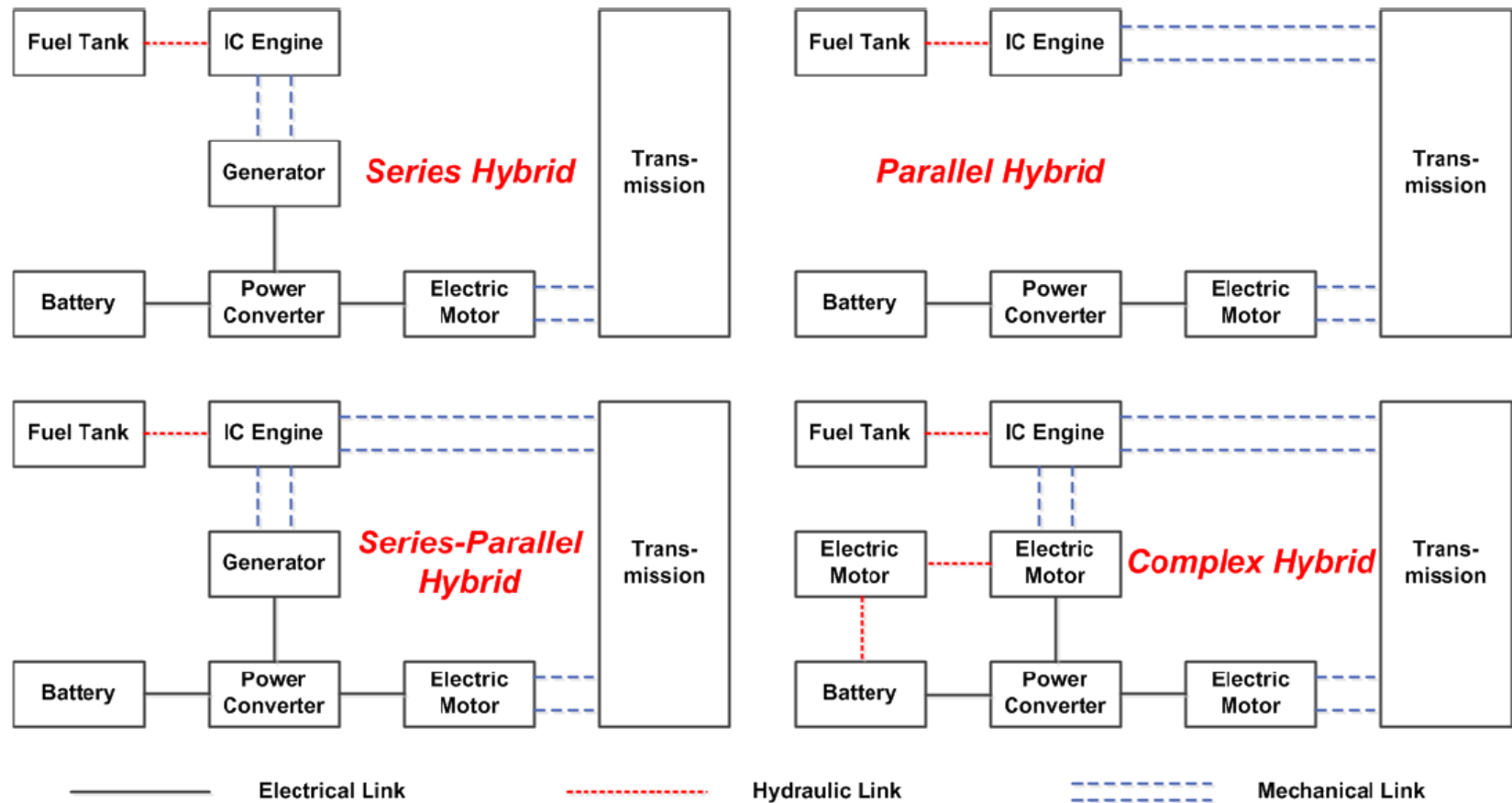
**The basic Powerplant include the installation of ROTAX 912 ULS/S engine 100 SHP@5800 RPM*

SEAGULL Aircraft – Alternative Powerplant: Hybrid



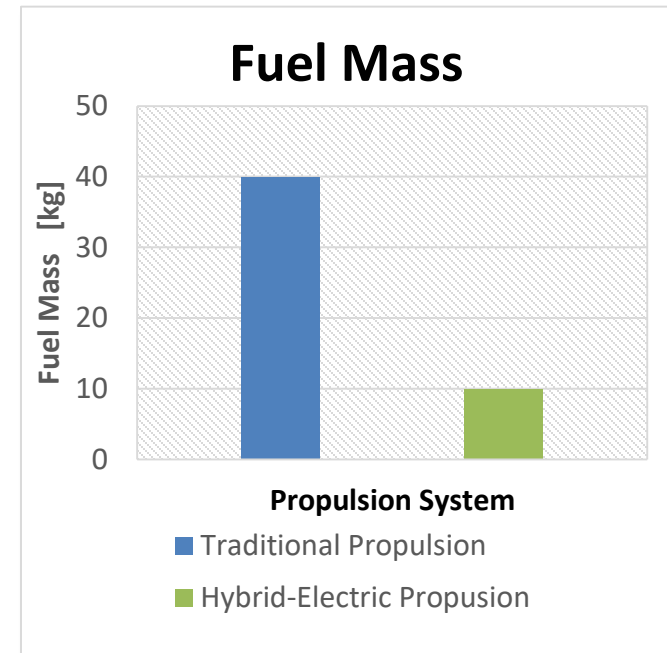
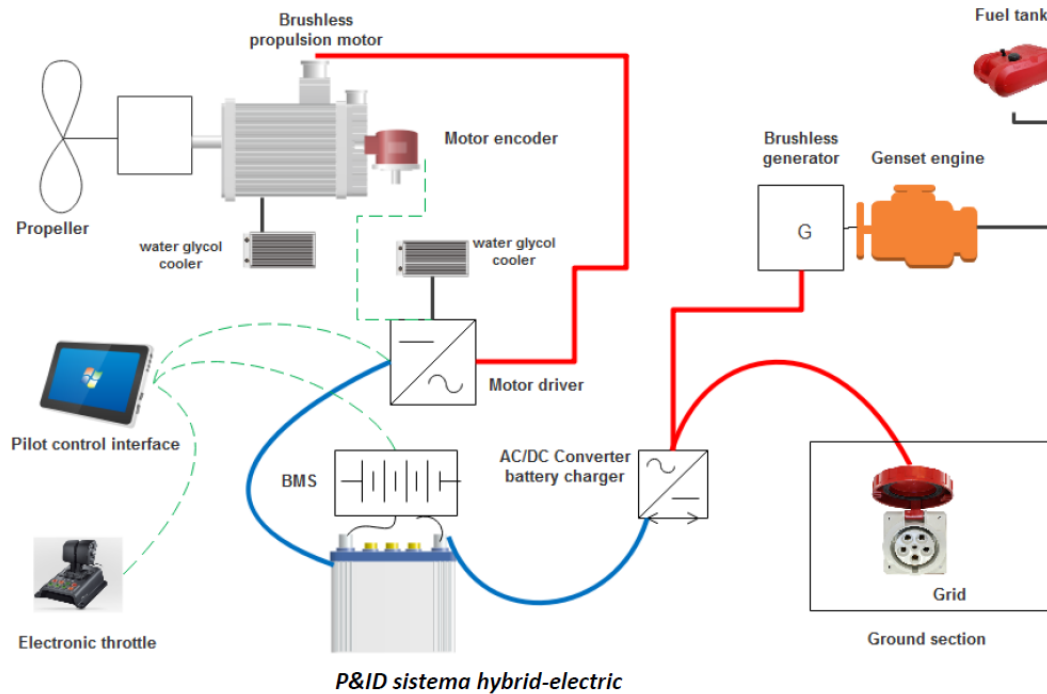
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Architecture of Hybrid-Electric Propulsion System



SEAGULL Aircraft – Alternative Powerplant: Hybrid

Series Hybrid-Electric Propulsion System



Main advantages of the Hybrid-Electric propulsion system:

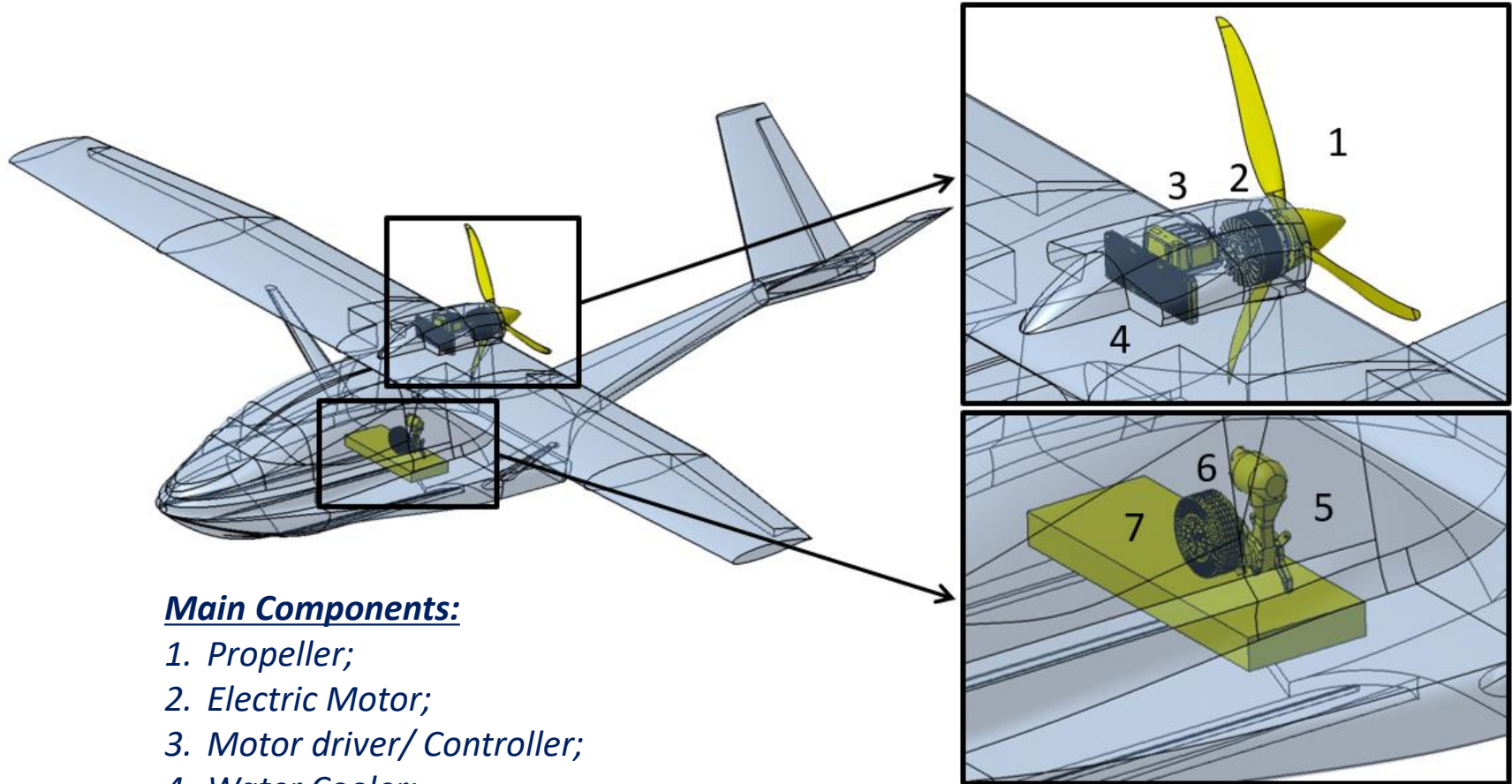
- Less consumption and pollution by using hybrid drives;
- Increase of efficiency of aircraft by distributed propulsion;
- Silent propulsion
- Lower operation costs (fuel, maintenance);
- Safety increase with redundant energy source.

SEAGULL Aircraft – Alternative Powerplant: Hybrid



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Hybrid- Electric Propulsion - SEAGULL



SEAGULL Aircraft – Airframe Architecture



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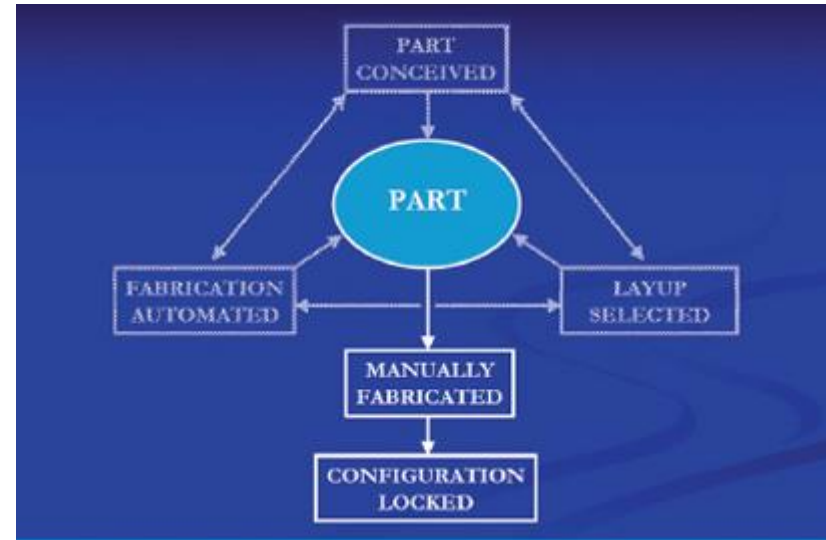
Fully composite amphibious means: Composite Materials >70% using Automated (AFP) and Out-of-Autoclave processes

Design Target
 $W_{TO} < 650\text{Kg}$
CS-LSA (Light Sport Aircraft)

- Low certification costs
- Low fuel consumption (low pollutants emission)

Design and Manufacturing based on
Part Centric Design Approach:

Manufacturing process defined
when the part is conceived



SEAGULL Aircraft – Airframe Architecture

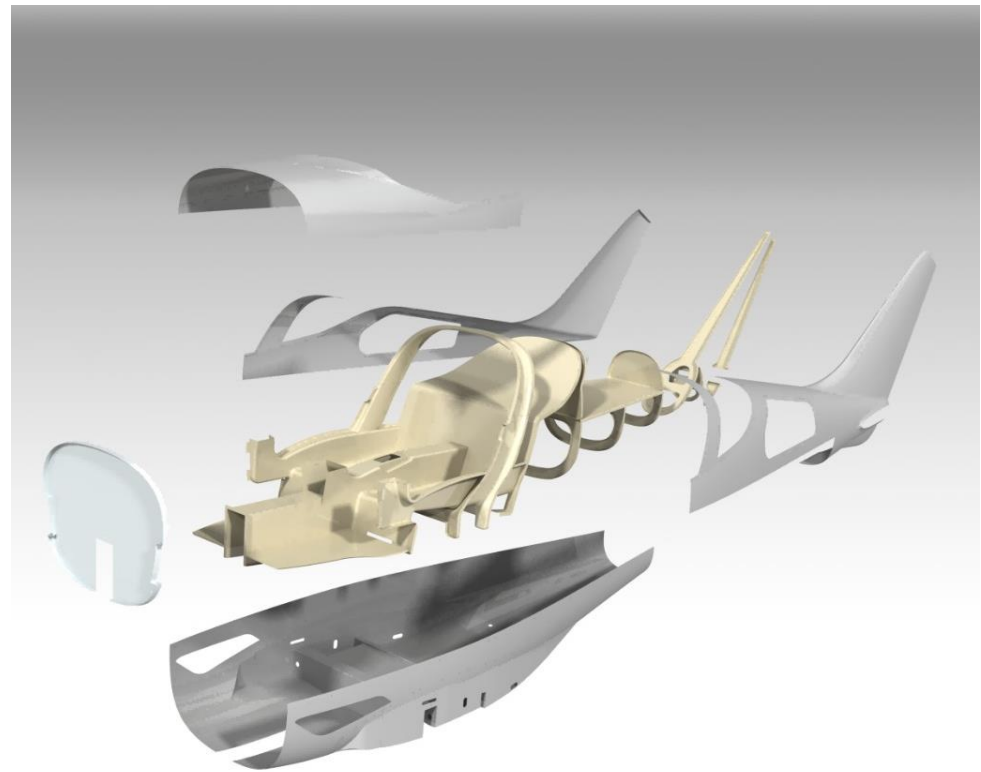


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Fuselage and Tail components architecture

The evaluation and definition of the proper manufacturing process and the fuselage airframe assembly of each component is under investigation.

*The use of large **monolithic parts** will extensively applied depending also by the manufacturing capabilities. When manufacturing constraints limit this approach the main components could be split into smaller subcomponents.*



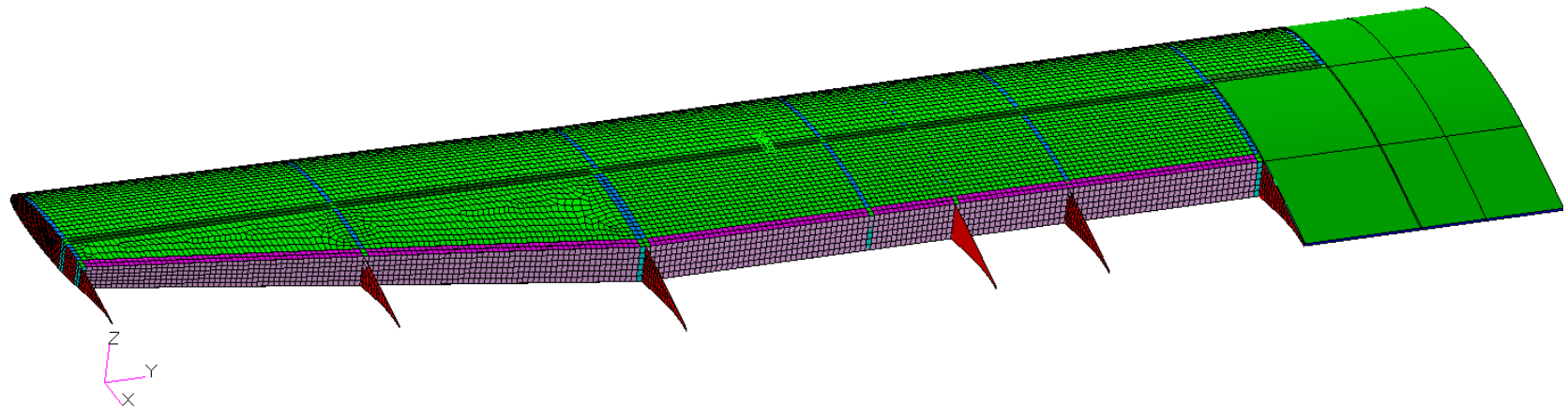
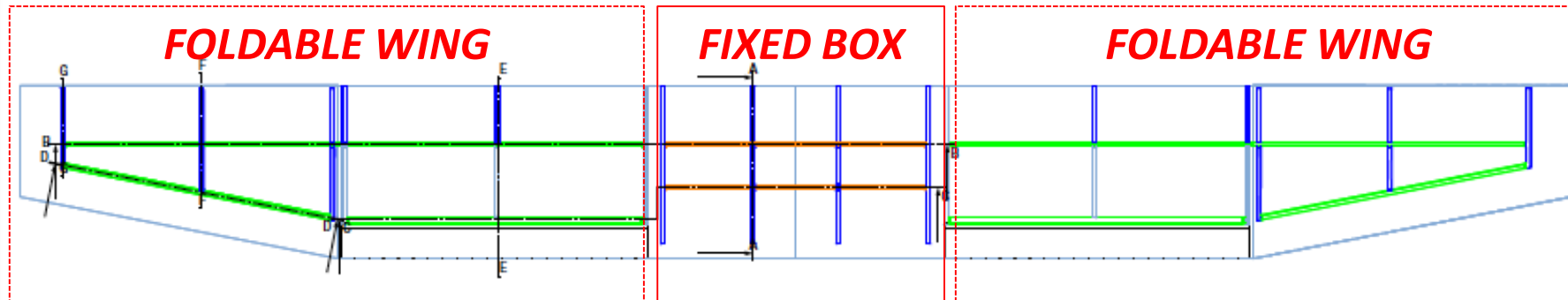
SEAGULL Aircraft – Airframe Architecture



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Wing components architecture

Wing composed by Foldable and Fixed parts



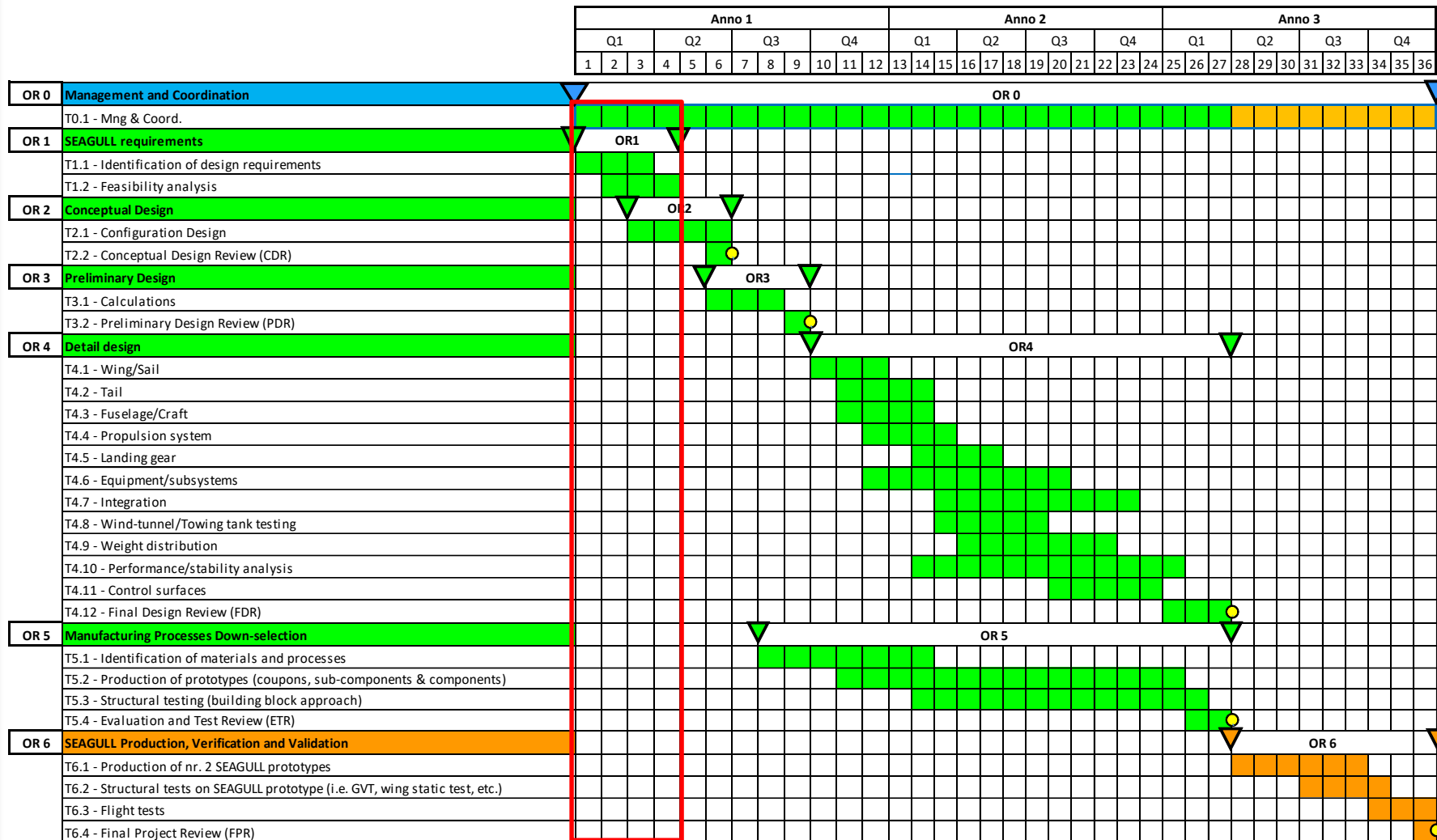
Ongoing activities:

- Study of the Folding mechanism composed by torsion tube and struct-actuator;
- .Ribs, Spars and Skin sizing by FEM upon defined the manufacturing processes

Activities scheduling - GANTT



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Start date: January 2018

← 3 years →

End date: December 2020

***Thank you
for your attention***

***If You Want To Go Fast, Go Alone.
If You Want To Go Far, Go Together.***



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