

2014 - 2020 Interreg V-A  
Italy - Croatia CBC Programme  
Call for proposal 2019 Strategic

## MARLESS (MARine Litter cross-border awarenESS and innovation actions)

Priority Axis: Environment and cultural heritage; Specific objective: 3.3 - Improve the environmental quality conditions of the sea and coastal area by use of sustainable and innovative technologies and approaches

### D.6.5.2 – Hardware of the mechanical filtering equipment

AT 6.5

WP 6

Version: FINAL  
Distribution: PUBLIC  
Date: 23/06/2023

## PROJECT MARLESS

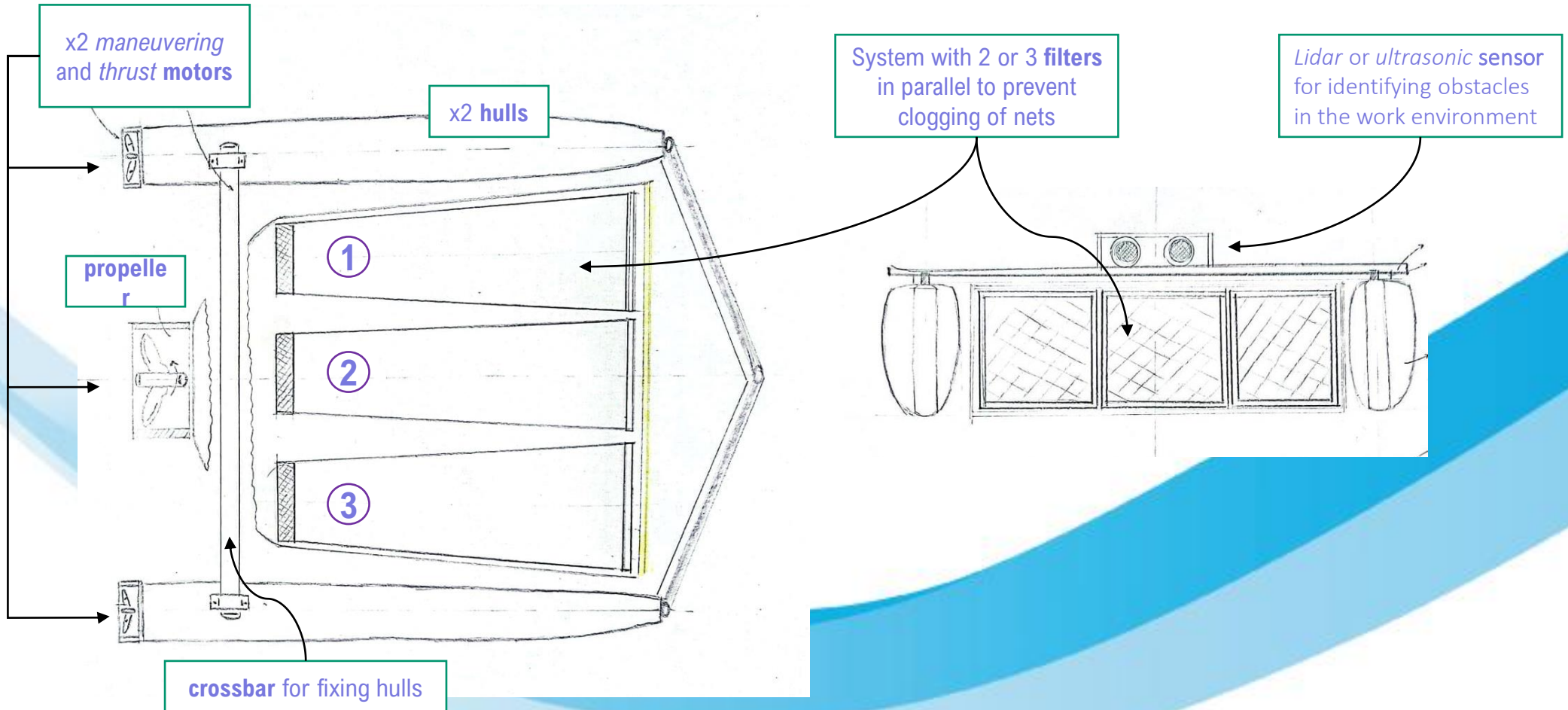
<b>Work Package:</b>	WP 6
<b>Activity:</b>	AT 6.5
<b>WP Leader:</b>	PP6 University of Bologna
<b>Deliverable:</b>	D.6.5.2 – Hardware of the mechanical filtering equipment

<b>Version:</b>	Final	<b>Date:</b>	23/06/2023
<b>Type:</b>	Slide presentation		
<b>Availability:</b>	Public		
<b>Responsible Partner:</b>	University of Bologna		
<b>Involved Partner</b>	University of Bologna		
<b>Editor:</b>	Daniela Francia		
<b>Contributors:</b>	/		

## D.6.5.2 – Hardware of the mechanical filtering equipment

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# Product Architecture



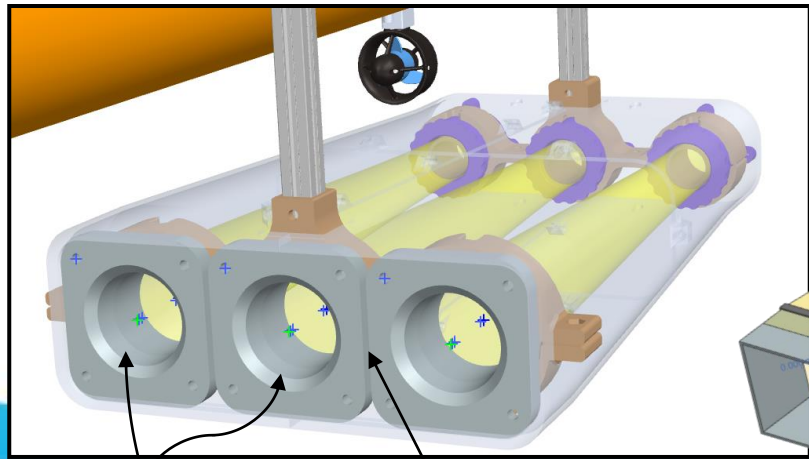
Platform for electronic components

Hull molded in parts + fiberglass / putty / gelcoat

Wider mesh to ward off macro-plastics

Thrust + filter efficiency increase

Maneuvering motors



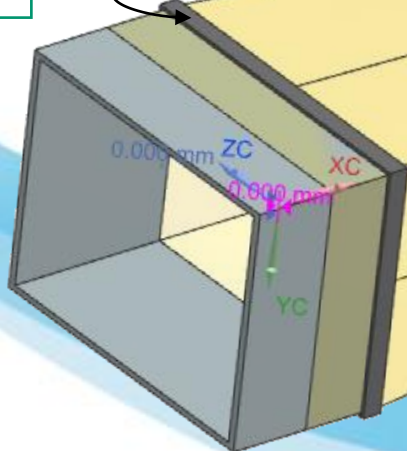
System with 2 or 3 filters in parallel to prevent clogging of nets

Filtering system: Mesh + collection cup

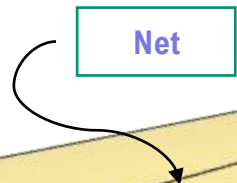
## Details on the filtration system



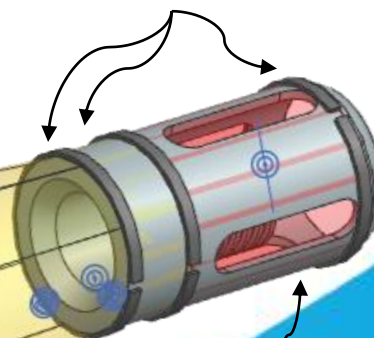
Clamp for fixing the net



Net



Clamps for fixing the net



Collection cup

## Details on the filtration system

$$V = 3 \times (\pi \times (0.03m)^2) \times L \times \frac{1}{1.78} \times \frac{1}{1.3} \times 10^3$$

Where:  
V is the flow rate in litres  
L is the trajectory length



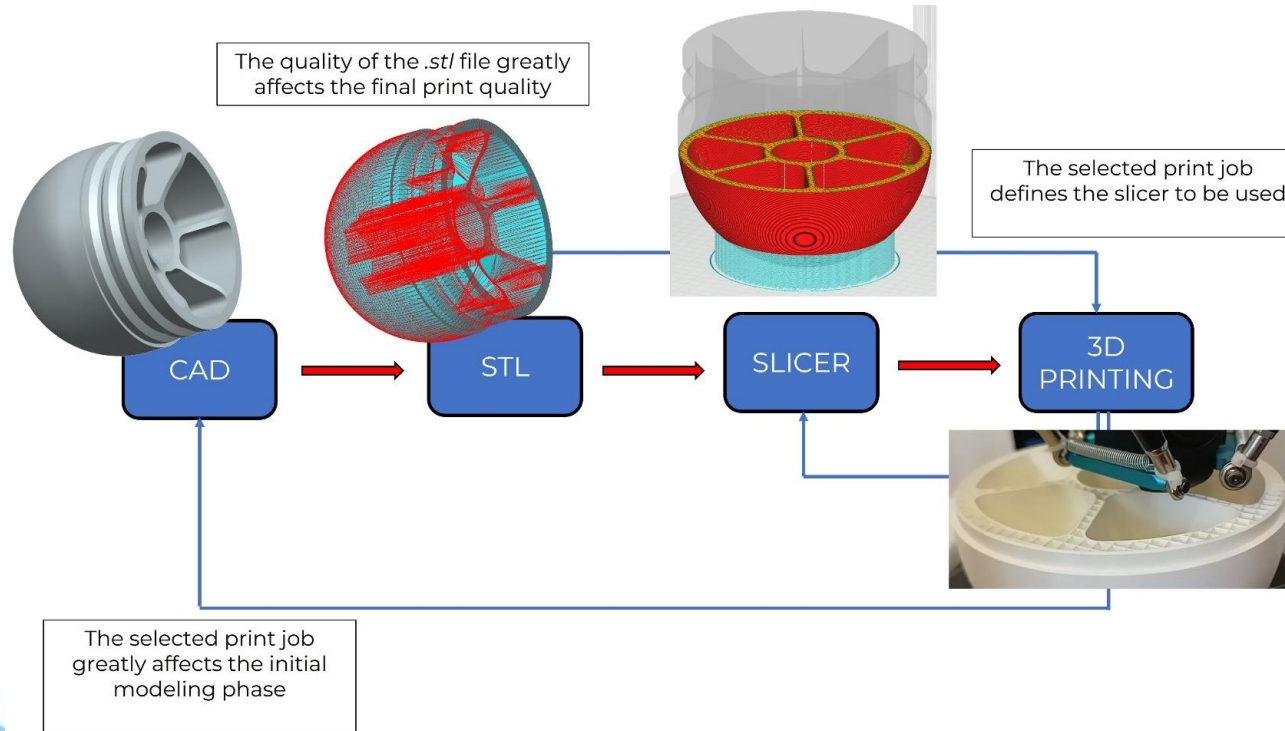
Single filter

## Specifics on the filtration system

Filtering Capacity		
Target Flow rate	20	m <sup>3</sup> /h
	0,005556	m <sup>3</sup> /s
Drone speed	2	knots
	3,704	km/h
	1,0289	m/s
Effective fluid flow area	0,00540	m <sup>2</sup>
Filter mesh size	0,50000	mm
Filter wire size	0,25000	mm
Filtering area	0,012149	m <sup>2</sup>
	121,490	cm <sup>2</sup>
Corrective factor	1,3	
Final filtering area	157,94	cm <sup>2</sup>
	0,015794	m <sup>2</sup>



# Filtration system by 3D Printing



## Filtering system assessment and testing




# Contacts

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