TRAWL VISION professional

INTRODUCING THE NEW PERFORMANCE OF SOFTWARE DESIGN AND FISHING SIMULATION

We thank the group of AcruxSoft developers and the feedback from our users for their contributions.

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Dear Users,

It is a pleasure to be in contact with you again. After a year and a half of development, we present to all of you two new software versions: **TVD** TrawlVisionDesigner (Designer) and **TVS** – Trawl Vision Simulator (Simulator). As you know, to design and simulate fishing art is big engineering challenge nevertheless we put all our effort and dedication to work hard and go together in this path.

Due to the growing demand of the fishing industry in the search for new technologies that benefit economic performance, the use of fishing gear in a rational way, in the reduction of fuel costs and the development of a sustainable fishery, our group of experts and fishery engineers focused on developing an innovative tool that provides concrete solutions to the current needs of the industry.

We'd like to thank all our users for joining us in these 13 years.

Kind regards

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NEW FUNCTIONS:

- New software compatibility and activation key for the new Windows system operators.
- To develop a new application that can be adapted to the new industry demands and new concept of fishing technology.
- To develop a tool that let us make an in-depht evaluation and analysis of fishing gear. Support the user with a new vision of their projects and enhance the efficiency from the academic, scientific and industrial framework.
- The new TVD contains an algorithm that evaluates the trawl net created by the user against a thousand successful designs and guides the user to improve its design.
- With the display and information per section in each panel and the totalized, you can have a better costs analysis, regarding materials for fabricating a new design.
- All information entered and processed by software is saved in a ¨ tdf¨ file with the possibility of high definition printing.
- The new print mode and makes presentations more professional.
- All files generated with our previous software are compatible with the new one.
- We can better evaluate the pairing efficiency based on: consumption, resistance to traction y power of vessel.
- The printout reflects all independent data per panel, offering a professional view of your projects with your customers or generates a register that is linked to the type of nets with the used doors, speed, spread, among others.

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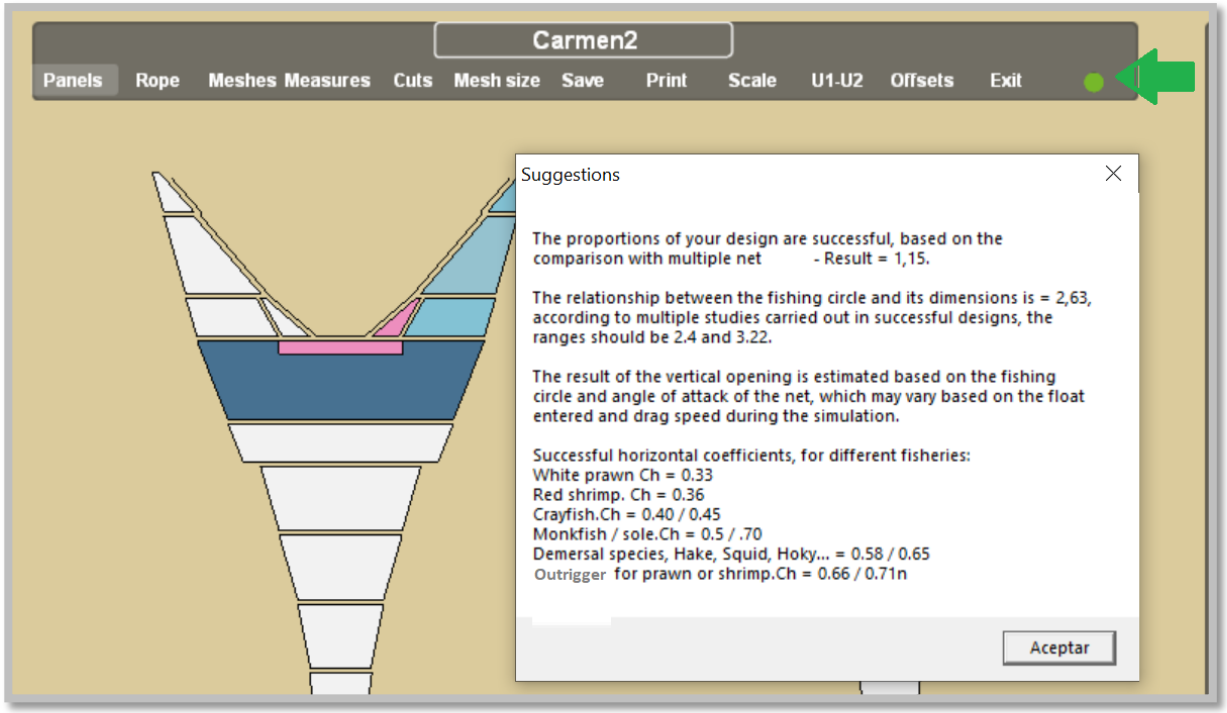
NEW FUNCTIONS IN THE TRAWL VISION DESIGNE

Analysis and evaluation of the design entered by the user

The new system, through an algorithm, allows analysing the design created by the user and guides it to improve the hydrodynamic qualities of the trawl.

The system analyses the proportions of the panels, the length of the rope (headrope and footrope) entered and the agorithm compares them to thousands of successful designs and then generates a diagnosis. The user can modify or iterate the measures and proportions until reaching the optimal design of their trawl net, through constant evaluation of the TVD software.

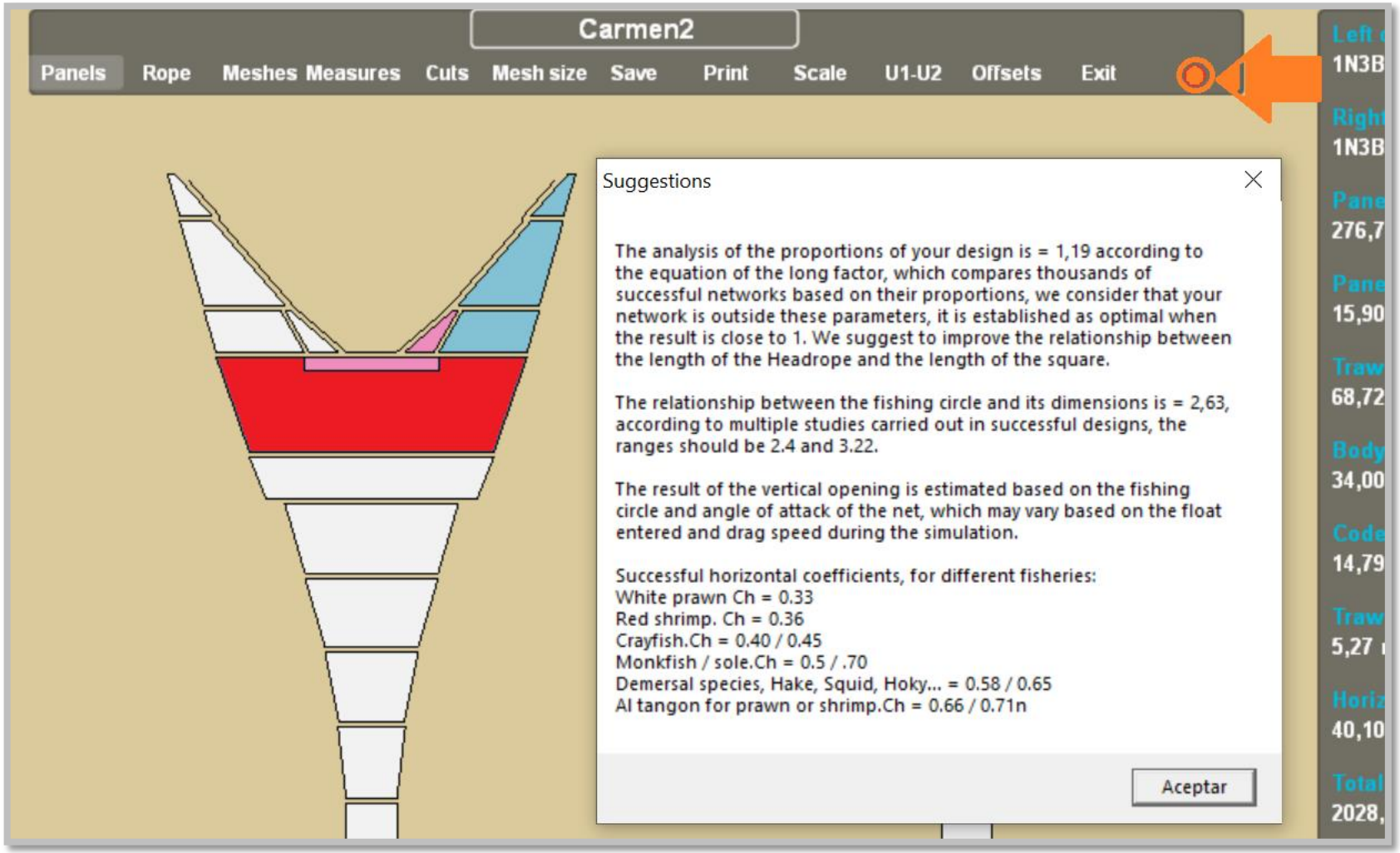


The green colour indicates that the proportions of the panels and ropes are within the successful ranges.

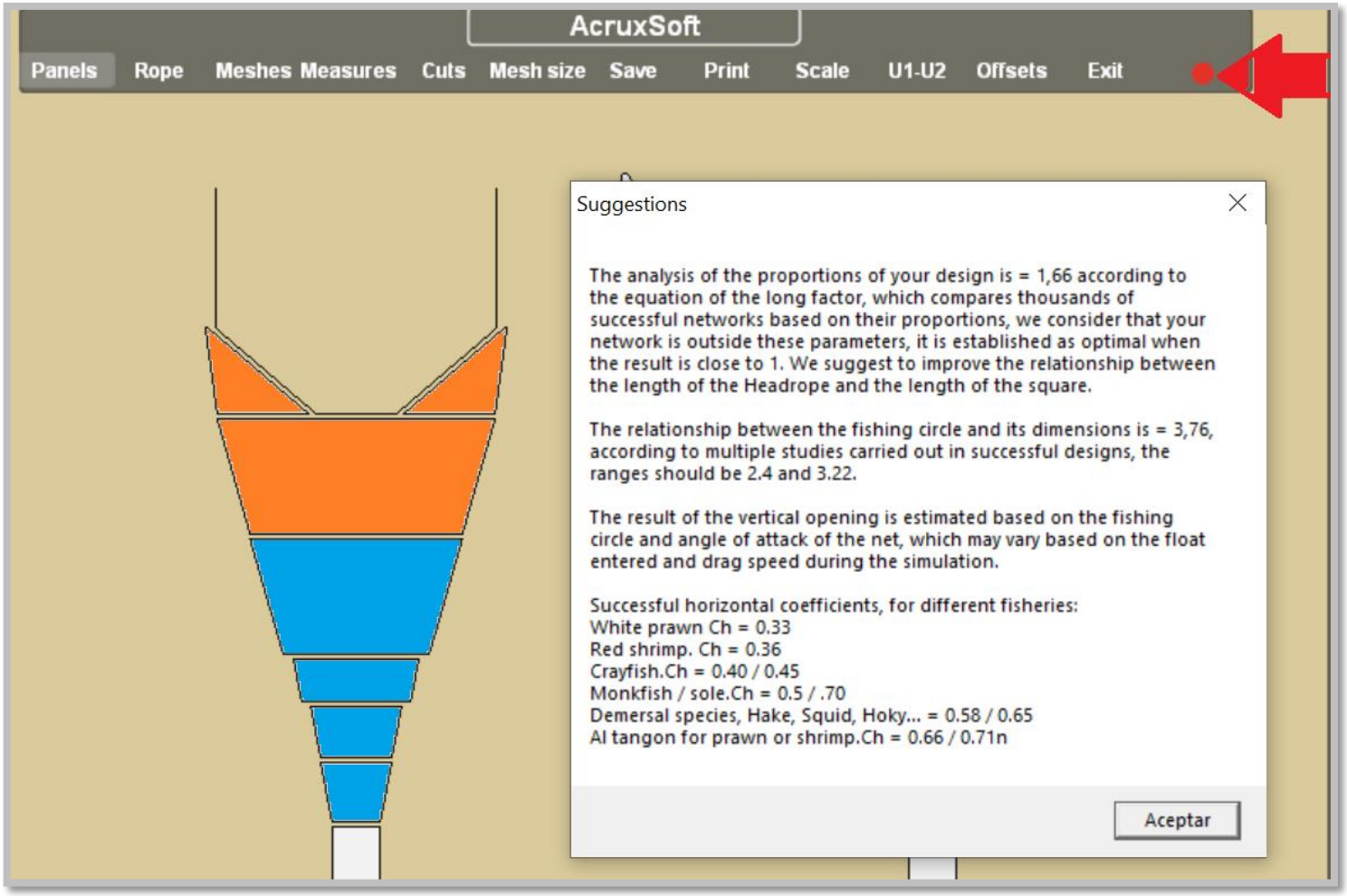
Orange indicates that certain parameters are correct.

The colour red indicates that the proportions of the panel, fishing circle, square length, headrope and footrope are outside the general ranges of success in a design.

The proportions between the length of the square and the lengths of the rope are not within the general parameters.



The length of the ropes, the proportions of the panels, the fishing circle and the length of the net are outside the general parameters of the trawl nets.

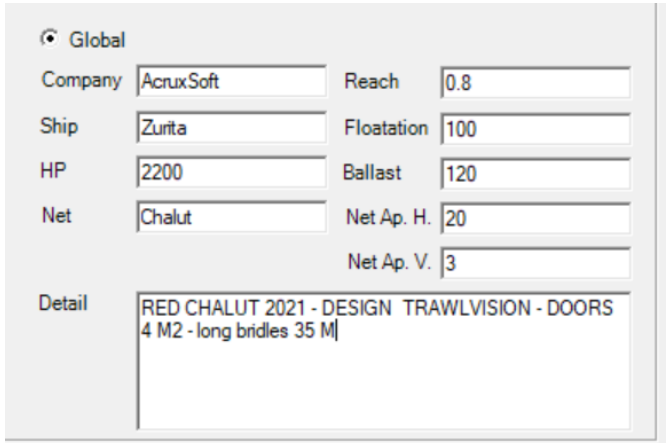


The new TVD presents all the information on the fishing gear, configured in a single view where the characteristics of the trawl net can be linked with the data of the vessel, the name of the company and the texts provided by the users. This information is used in its entirety for analysis, evaluation, classification and recording to improve the evolution of trawl design. The global vision of the characteristics of the net allows us to achieve optimal ranges of the angles of attack, propagation, filtering and consumption.

All the information can be saved to generate a record of all the developed projects related to the type of vessel, doors, target fishing, clients.

Company	AcruxSoft	**Panel Area**	683 m²	**Headrope**	28,9 m	**Floatation**	100 kgf	Net Chalut 2021 – TrawlVision Design Doors 2,6 m² Thyson – Thyboron Project created on August 18th, 2021 by Frank Chalkling
Vessel	Zurita	**Thread Area**	63.8 m²	**Footrope**	37,1 m	**Ballast**	120 kg	
HP	1000	**Net lengtth**	48,7 m	**Lengthen**	0,8 m	**Net spread**	20 m	
Net	Chalut	**Fishing circle**	68,5 m	**Attack net**	14,9°	**Vertical Ap**	3 m	

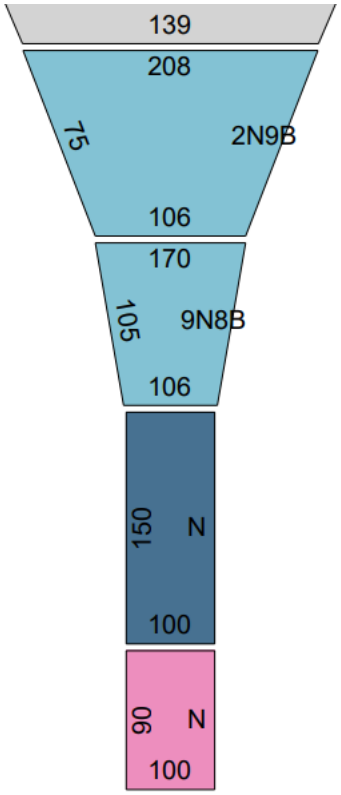
The software calculates the data indicated in blue. The data in black colour is entered by the user, as follows:



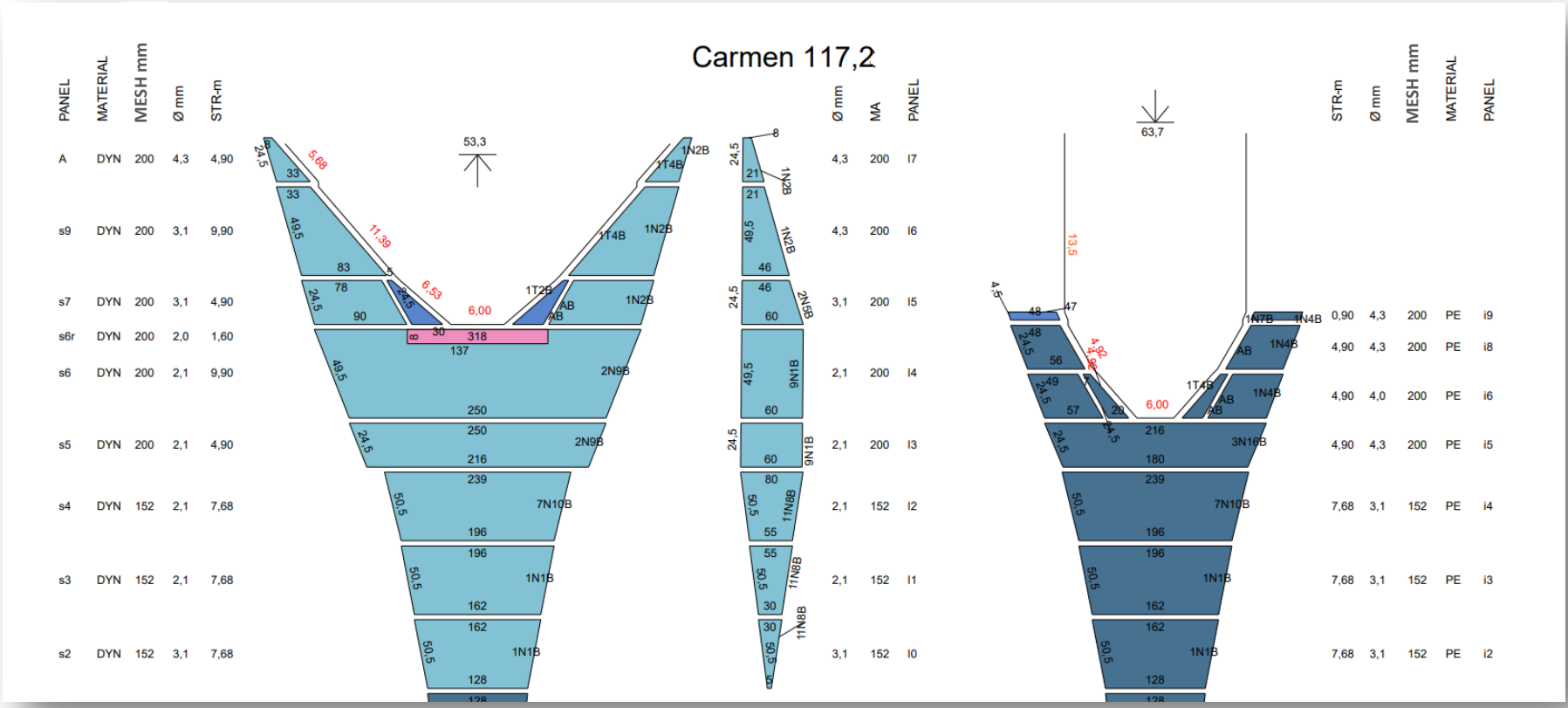
Click ¨Global¨ to activate the following setup to enter information or data given by the user.

The new system allows colouring the different panels according to the preferences of the users, so that they can point out and write their comments.

H	PER	80	1,6	6,00
I	NY	50	1,4	5,25
J	NY	50	1,4	7,50
K	NY	50	1,4	4,50

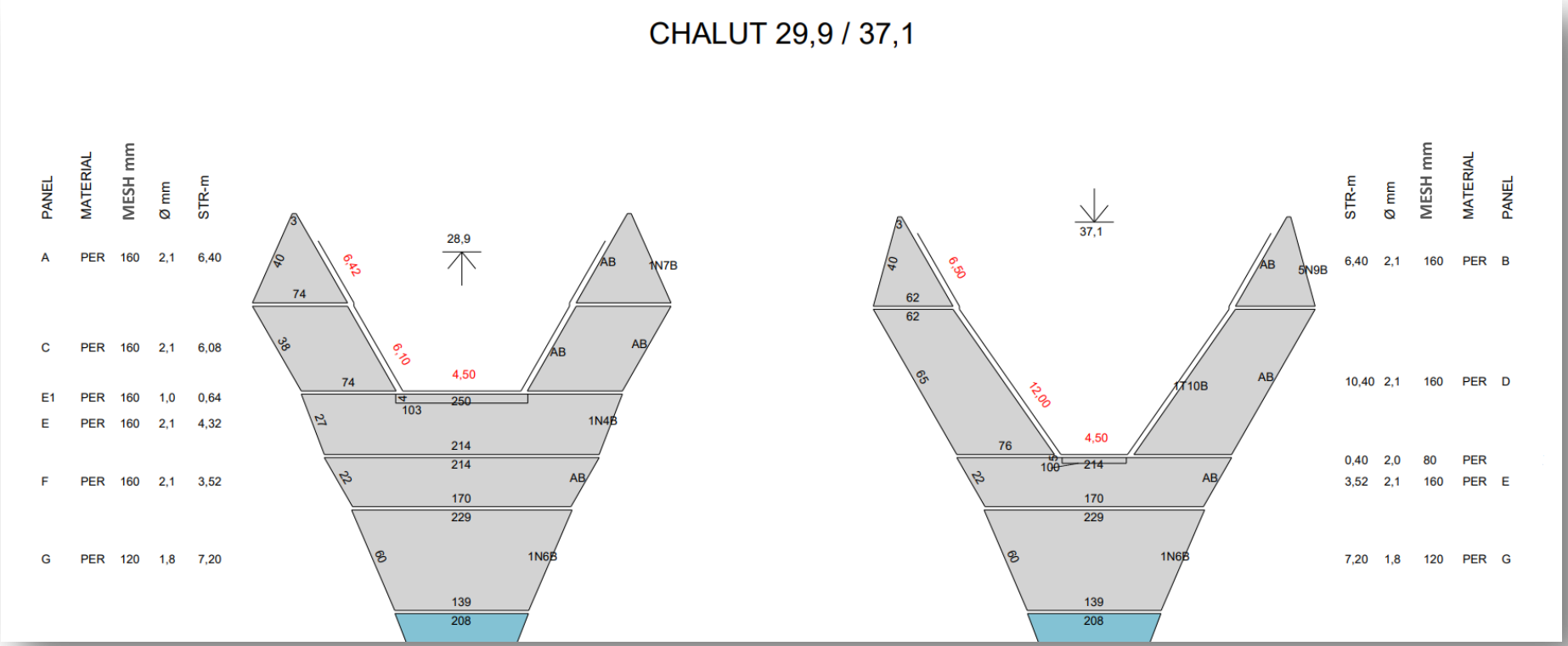


The system allows you to enter different dimensions of ropes, lower lengthen ropes, materials and identification of the panel.



You can classify or name the panels or sections of the net according to your preferences; also, you can enter the material of the threads and the runnage.

Based in data you register, software will calculate: **Length of each panel with the stretched mesh, weight per panel with knot or without knot, the length of the twine,** cuts, twine areas, attack angle, solid surface net trawl, optimal vertical and horizontal spread and filtration.



- **STR m** is the length of each panel per section in meters.

- **Runnage -** Most of catalogues of materials show this extremely useful information that indicates the quantity of twine, in meters. You might use per kilogram of final product. Meters/ Kilograms or Yards/ Pound can be use in this software, up to user´s preferences, to calculate the weight per panel and for all the net with knots or not. Through these results, we can find out more detailed the twine properties unify or distribute weights inside the net and make an accuracy calculation of quantity of thread necessary for the construction of the net. All this can support you to determinate the costs in the construction of trawl net.

- **Filtration,** we present a function through the design projection that allows you to visualize the filtration level of the net according horizontal spread of trawl net.

- **The red numbers,** user can register different sections of the headrope and footrope.

- **Belly classification** – Depending on the user's criteria, a letter or a number can be assigned to the different panels of the net. For example: ¨A, B, B1… ¨.

- Now the software allows you to use FAO type cut nomenclature and also French nomenclature. Example, FAO 1N 2B = French nomenclature 2P 1M.

- Trawl cuts may be the result of the software or entered by the user.

- **Material** – The software allows recording the type of material used in the belly or panels.

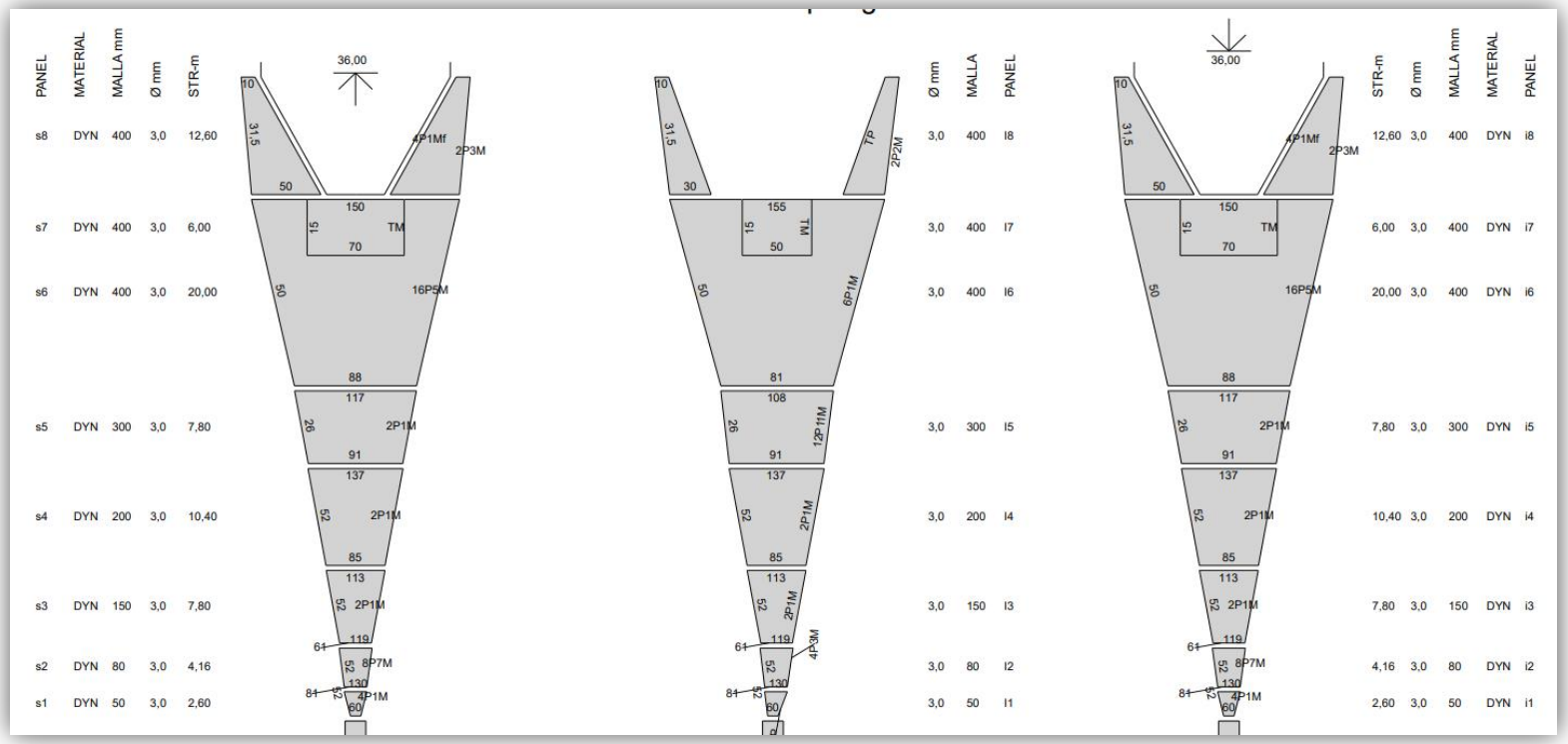
- **Panel´s weight** – Software calculates weight of panels with knots or not, to know the weight give you the following benefits:
    i. To make an exact calculation of the costs based on the weight of the materials.
    ii. To evaluate the twine quality based on the weight, diameter and length of the twine.
    iii. To analyse the possibility of modify the sections of the net to obtain a gradual weight of all the fishing art sections.

iv. Based on the known weight, we can buy in exact quantities the necessary materials to repair the damaged belly or evaluate the change for better materials.

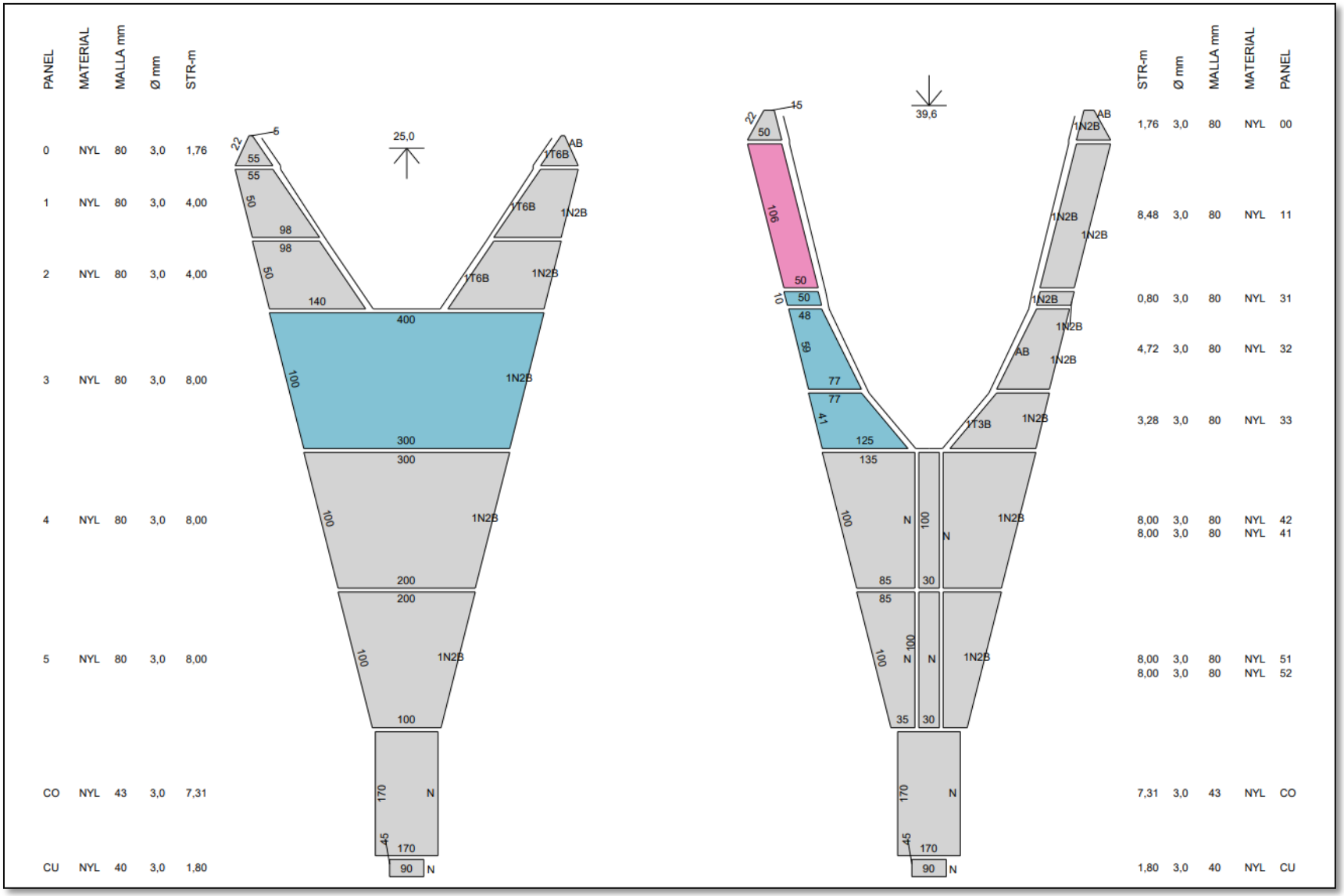
v. The software calculates the difference between using a belly with knot and without knots, to evaluate its benefits when determining the most suitable type of material.

vi. With the software you can calculate the twine area based on the deployment and filtration level.

vii. During simulation, the optimum design for the application can be determined easily and cost-effectively by changing the net trawl.

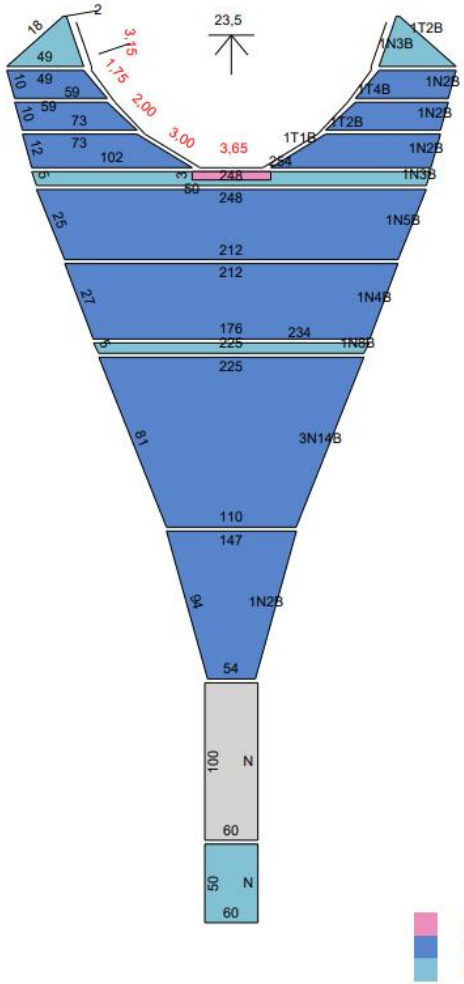


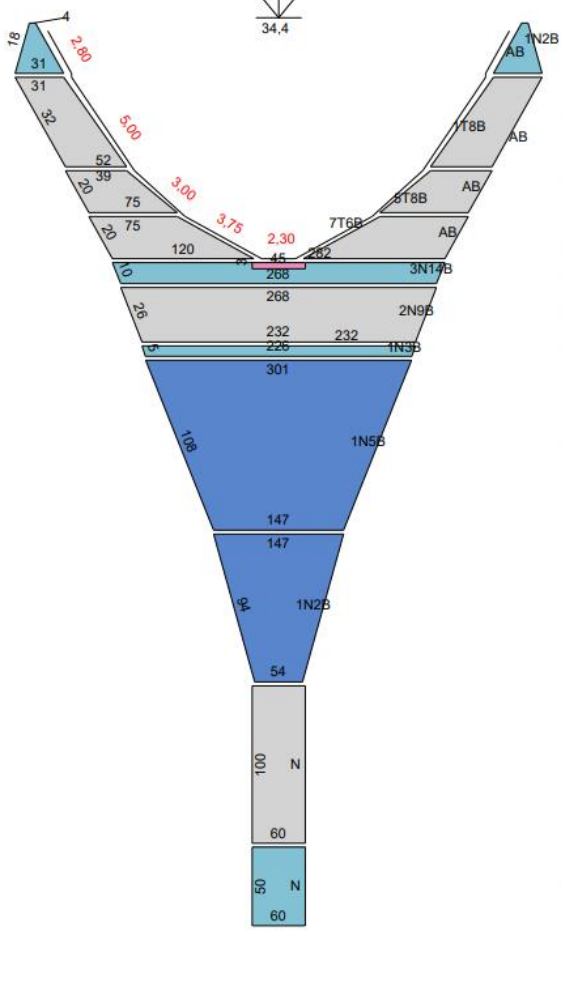
PANEL	MATERIAL	MALLA mm	Ø mm	STR-m
0	NYL	80	3,0	1,76
1	NYL	80	3,0	4,00
2	NYL	80	3,0	4,00
3	NYL	80	3,0	8,00
4	NYL	80	3,0	8,00
5	NYL	80	3,0	8,00
CO	NYL	43	3,0	7,31
CU	NYL	40	3,0	1,80



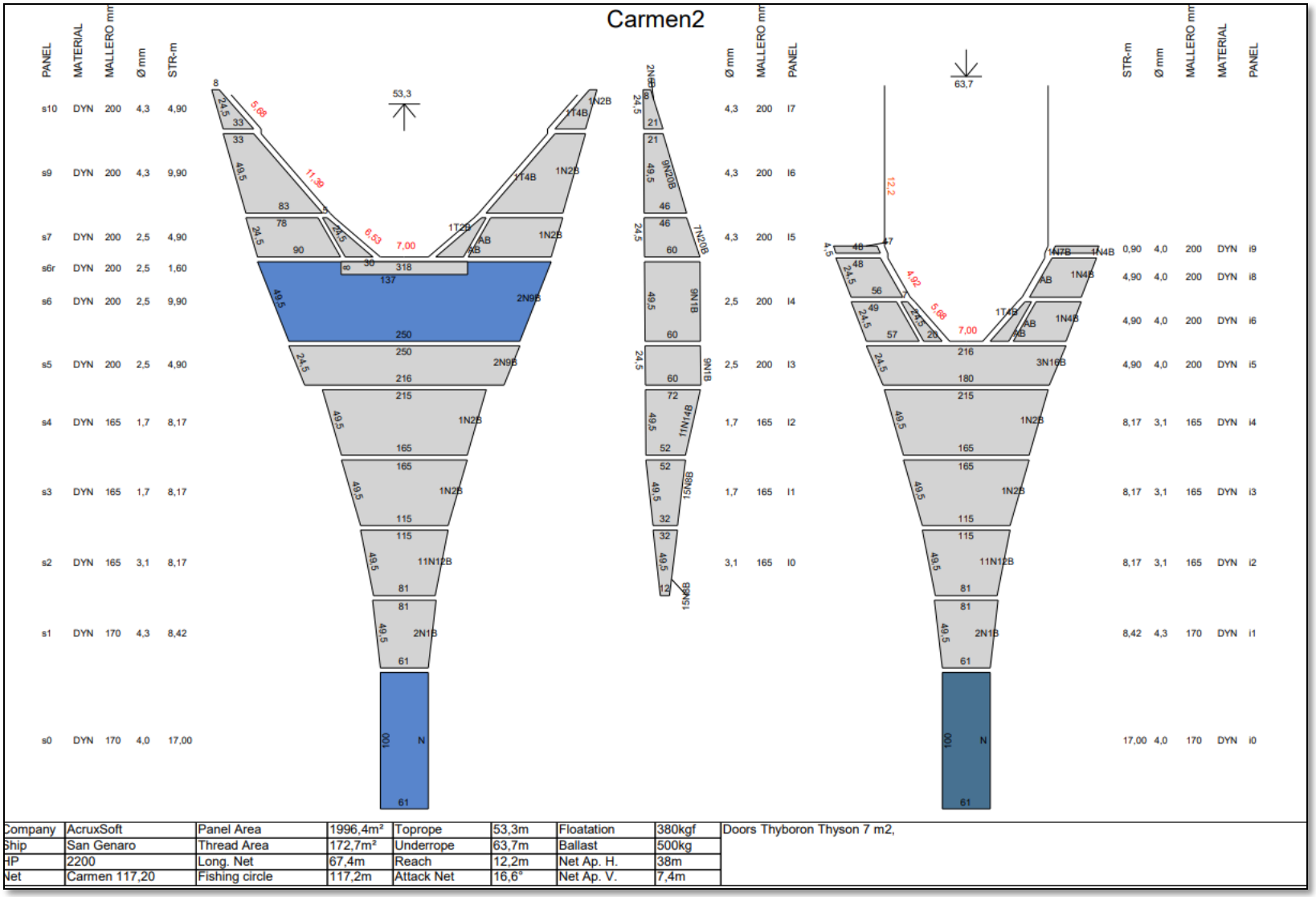
STR-m	Ø mm	MALLA mm	MATERIAL	PANEL
1,76	3,0	80	NYL	00
8,48	3,0	80	NYL	11
0,80	3,0	80	NYL	31
4,72	3,0	80	NYL	32
3,28	3,0	80	NYL	33
8,00	3,0	80	NYL	42
8,00	3,0	80	NYL	41
8,00	3,0	80	NYL	51
8,00	3,0	80	NYL	52
7,31	3,0	43	NYL	CO
1,80	3,0	40	NYL	CU

PANEL	MATERIAL	MESH mm	Ø mm	STR-m
A	PE	160	4,0	2,88
B	PE	160	4,0	1,60
C	PE	160	4,0	1,60
D	PE	160	4,0	1,92
E0	PE	160	5,0	0,48
E	PE	160	5,0	0,80
F	PE	160	4,0	4,00
G	PE	160	4,0	4,32
H	PE	120	4,0	0,60
I	PA	120	2,5	9,72
J	PE	90	2,5	8,46
K	DYN	90	4,0	9,00
L	DYN	90	4,0	4,50





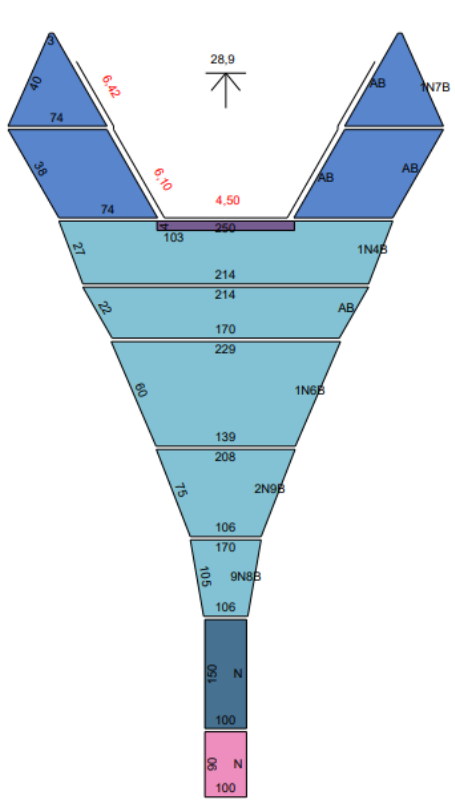
STR-m	Ø mm	MESH mm	MATERIAL	PANEL
2,88	4,0	160	PE	A0
5,12	4,0	160	PE	B0
2,40	4,0	120	PE	C0
2,40	4,0	120	PE	D0
0,36	3,0	120	DYN	E1
1,20	4,0	120	PE	E0
3,12	4,0	120	PE	F0
0,60	4,0	120	PE	G0
9,72	4,0	90	PA	H0
8,46	3,0	90	PE	I0
9,00	4,0	90	DYN	K0
4,50	4,0	90	DYN	K0

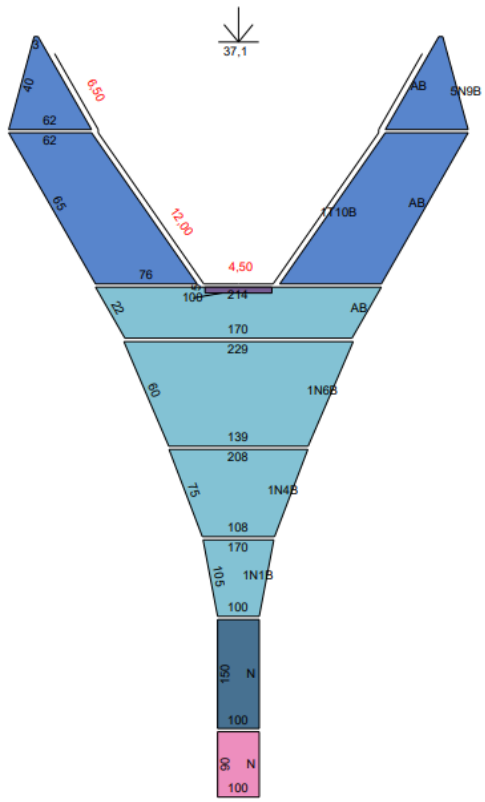


Company	AcruxSoft	Panel Area	1996,4m²	Toprope	53,3m	Floatation	380kgf	Doors Thyboron Thyson 7 m2,
Ship	San Genaro	Thread Area	172,7m²	Underrope	63,7m	Ballast	500kg	
HP	2200	Long. Net	67,4m	Reach	12,2m	Net Ap. H.	38m	
Net	Carmen 117,20	Fishing circle	117,2m	Attack Net	16,6°	Net Ap. V.	7,4m	

CHALUT 29,9 / 37,1

PANEL	MATERIAL	MALLERO mm	Ø mm	STR-m
A	PER	160	2,1	6,40
C	PER	160	2,1	6,08
E1	PER	160	1,0	0,64
E	PER	160	2,1	4,32
F	PER	160	2,1	3,52
G	PER	120	1,8	7,20
H	PER	80	1,6	6,00
I	NY	50	1,4	5,25
J	NY	50	1,4	7,50
K	NY	50	1,4	4,50





PANEL	MATERIAL	MALLERO mm	Ø mm	STR-m
B	PER	160	2,1	6,40
D	PER	160	2,1	10,40
E1	PER	80	2,0	0,40
E	PER	160	2,1	3,52
G	PER	120	1,8	7,20
H	PER	80	1,6	6,00
I	NY	50	1,4	5,25
J	NY	50	1,4	7,50
K	NY	50	1,4	4,50

Doble
Dynnema
Eurored
Square
Simple

Company	AcruxSoft	Panel Area	683,0m²	Toprope	28,9m	Floatation	100kgf	RED CHALUT 2021 - TRAWLVISION, Doors 3 m2,
Ship	Zurita	Thread Area	63,8m²	Underrope	37,1m	Ballast	120kg	
HP	2200	Long. Net	38,8m	Reach	0.8m	Net Ap. H.	20m	
Net	Chalut	Fishing circle	68,5m	Attack Net	14,9°	Net Ap. V.	3m	

The thread area is equal to the solid surface.
The following chart gives you a unique display of panel details, the total weight of the net and area with knots and without them.

PANEL	MATERIAL	RUNNAGE [m/Kg]	MESH [mm]	DIAMETER [mm]	TWINE LENGTH [m]	PANEL WEIGHT without KNOTS	TWINE AREA without KNOTS	PANEL WEIGHT with KNOTS [Kg]	TWINE AREA with KNOTS [m²]	WORK AREA [m²]
Upper view										
A	PER	370	160	2,10	493	2,66	2,07	3,48	2,50	34,30
C	PER	370	160	2,10	900	4,86	3,78	6,36	4,57	62,63
E	PER	370	160	2,10	2004	5,42	4,21	7,08	5,09	69,76
E1	PER	475	160	1,00	132	0,28	0,13	0,33	0,15	4,59
F	PER	370	160	2,10	1352	3,65	2,84	4,77	3,43	47,04
G	PER	640	120	1,80	2650	4,14	4,77	5,54	5,91	69,15
H	PER	715	80	1,60	1884	2,63	3,01	3,76	3,98	32,78
I	NY	700	50	1,40	1449	2,07	2,03	3,24	2,94	15,76
J	NY	700	50	1,40	1500	2,14	2,10	3,35	3,04	16,31
K	NY	700	50	1,43	900	1,29	1,29	2,02	1,86	9,79
Lower view										
B	PER	370	160	2,10	416	2,25	1,75	2,94	2,11	28,95
D	PER	370	160	2,10	1435	7,76	6,03	10,14	7,29	99,89
E	PER	370	160	2,10	1352	3,65	2,84	4,77	3,43	47,04
E1	PER	475	80	2,00	80	0,17	0,16	0,25	0,22	1,39
G	PER	640	120	1,80	2650	4,14	4,77	5,54	5,91	69,15
H	PER	715	80	1,60	1896	2,65	3,03	3,78	4,00	32,99
I	NY	700	50	1,40	1418	2,03	1,98	3,17	2,87	15,42
J	NY	700	50	1,40	1500	2,14	2,10	3,35	3,04	16,31
K	NY	640	50	1,40	900	1,41	1,26	2,20	1,82	9,79

	SOLID SURFACE without KNOTS [m2]	WEIGHT without KNOTS
TOP PANELS	26,23	29,15
BOTTOM PANELS	23,92	26,19
TOTAL	50,15	55,34

	SOLID SURFACE with KNOTS [m2]	PANEL WEIGHT with KNOTS [kg]
TOP PANELS	33,50	39,93
BOTTOM PANELS	30,72	36,15
TOTAL	64,22	76,08

This graphic shows the option of enter data about fishing gear

DATA ENTRY

User can register a letter or number to identify the panel or belly.

Register the type material with three letters

Register of runnage

You can enter the diameter of the twine, up to the hundredths.

You can enter the diameter of the twine, up to the hundredths.

Number of meshes of the panel

Mesh type: square or diamond

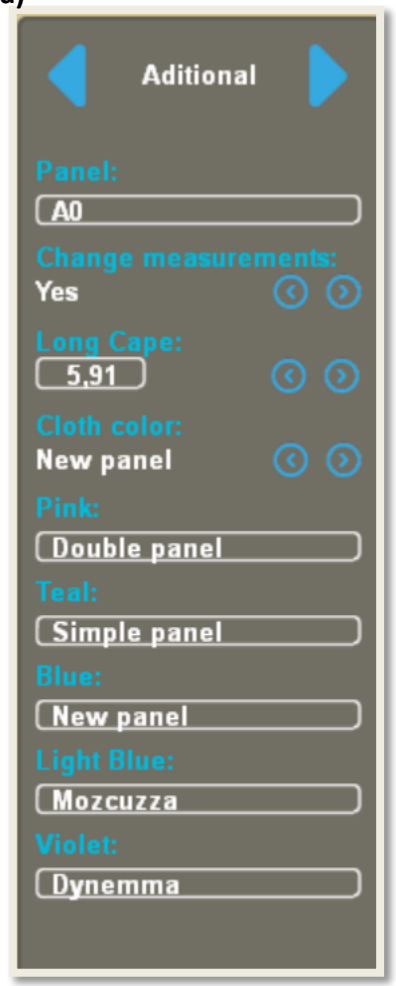
Coefficient U1 y U2

Trawl net filtration level. Kindly note the importance of this section due to general filtration of the net or deployment of mesh based on the horizontal spread and attack angle. This result is calculated by the software and is important to evaluate the mesh selectivity and water filtration.

NEW WINDOWS FOR REGISTER ADDITIONAL DATA OF THE NET

You can use colours to identify the panels and link them with texts to record more details about the trawl net.

a)



Identification of the selected panel.

Through this option the user can change the measurements of the headrope and footrope sections. You can view the results using global printing.

The user can enter the data or measurements of the different sections of the headrope and footrope, (wings and mouth of the net) or leave the measurements that are shown by default, can be seen in the global

Software contains five colours that can be used in the panels

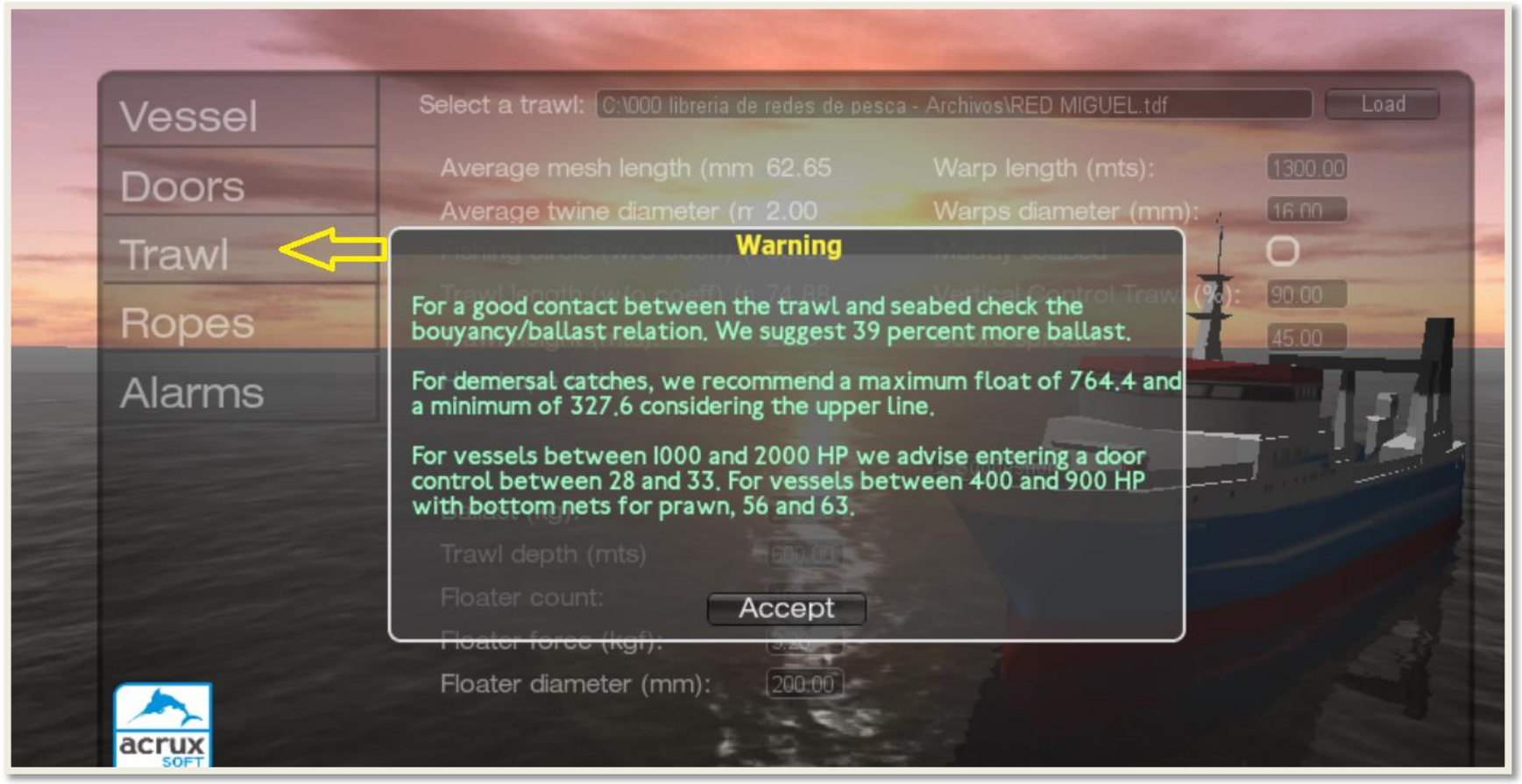
This option allows registration of the text per colour chosen. They will be detailed in the global printing.

TrawlVisionSimulator

By entering the ship's nominal power, the software calculates the maximum force range it has for the trawler, expressed in kgf. With the result, you can evaluate the dimensions of the fishing gear and evaluate the speed limits that can be trawl. Suggestions will also be given, regarding the surface, weight of the doors, level of net contact with the bottom and number of floats.

During the simulation of the net, we can find the maximum trawl speed according to the power of the ship and the configuration of the designed system.

We also present a new calculation function to estimate the vertical opening of the net, as a function of **the trawl speed, fishing circle and buoyancy**, according to the design characteristics of the net.



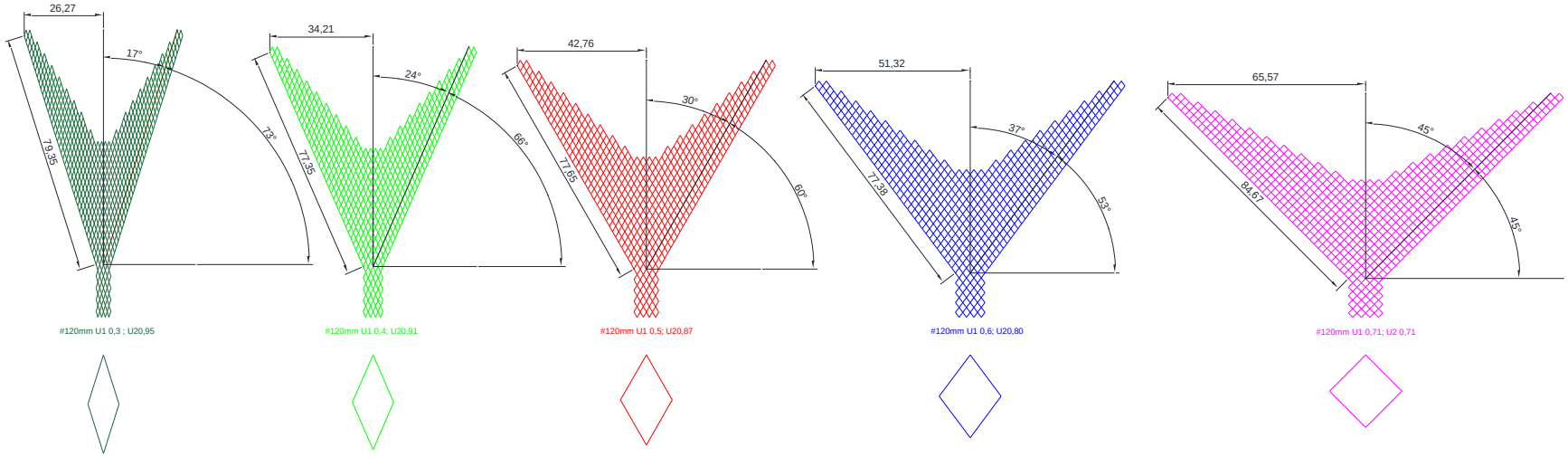
During simulation, user can modify the doors spread to get the correct angle based on doors deployment, mesh length, wings spread, percentage of filtration and total resistance.

The new results in the simulation window are:

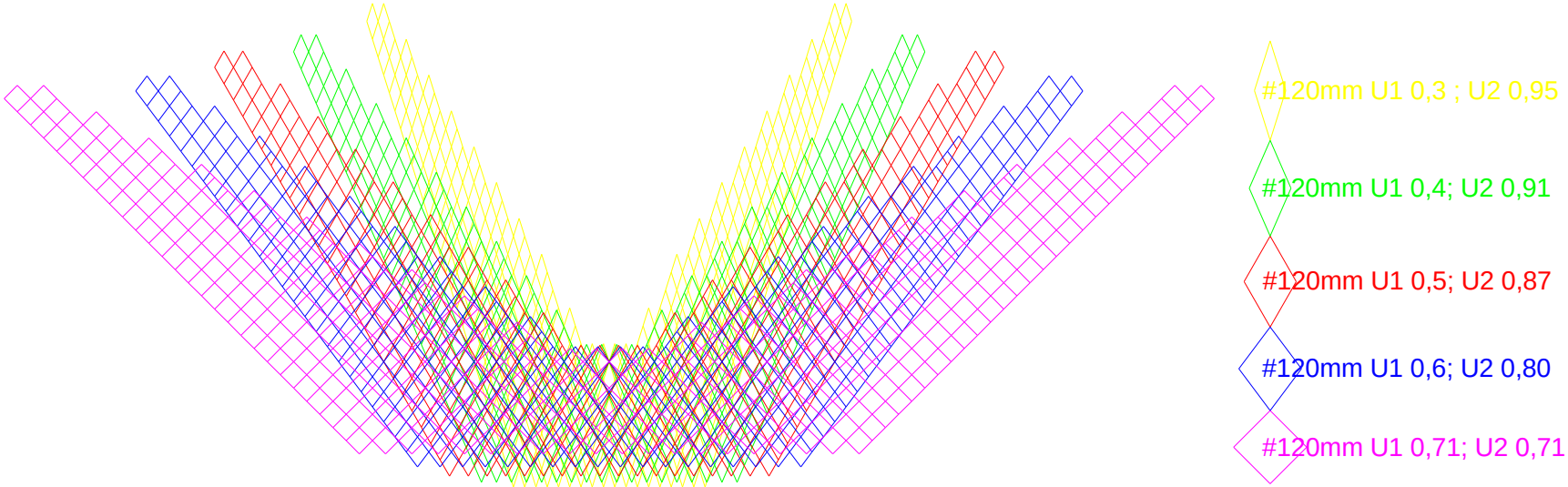
I. Trawl net filtration.
II. New concept of technical efficiency of fishing gear. It is considered for demersal species that the catch starts from the trawl doors- Trawl area from doors.
III. Total flotation of the trawl.
IV. ¨Power of doors¨, this function allows modifying the spread of the doors allowing to evaluate the resistance changes and to know the optimal parameters of the attack angles and the optimal spread of the net.

V. FILTRATION

The result is based on the following tenet:



SUPERPOSED GRAPHIC



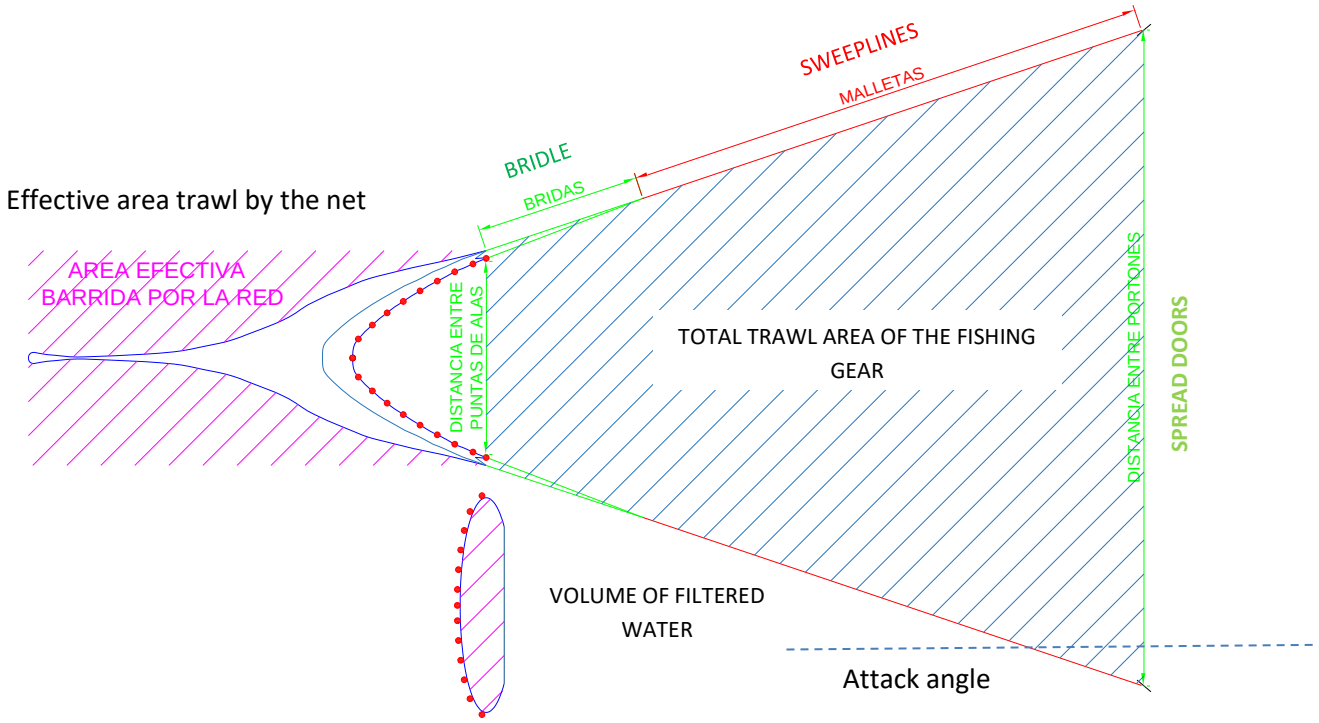
Through the variation of the net spread, the angle of attack and the filtration level of the mesh of the trawl can be evaluated.

Technical efficiency:

Software offers two results the technical efficiency calculations and they are:

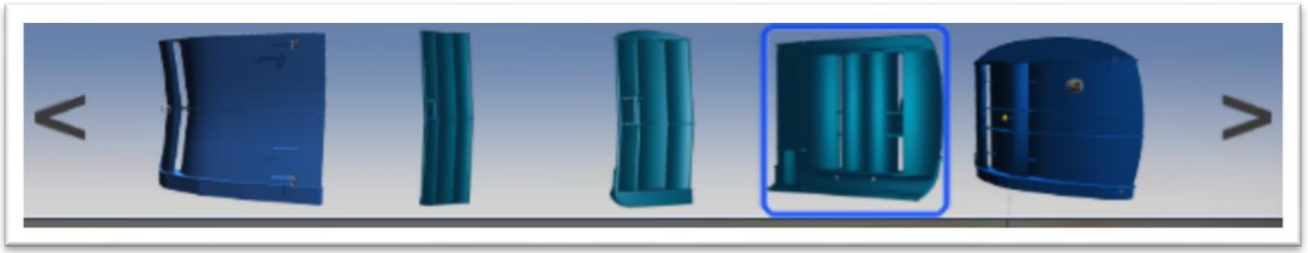
- **Volume of water filtered**
- **Trawl area**, the catch starts from the doors to the trawl net.

It is important to know the technical efficiency of the fishing gear, in order to project the catch potential based on consumption. During the simulation, we will be able to observe the power used (kgf) at different speeds and to know the maximum permissible range for the ship. We can also know the drag area and the volume of filtered water to design new strategies that help us to be more profitable in production with less fuel consumption.

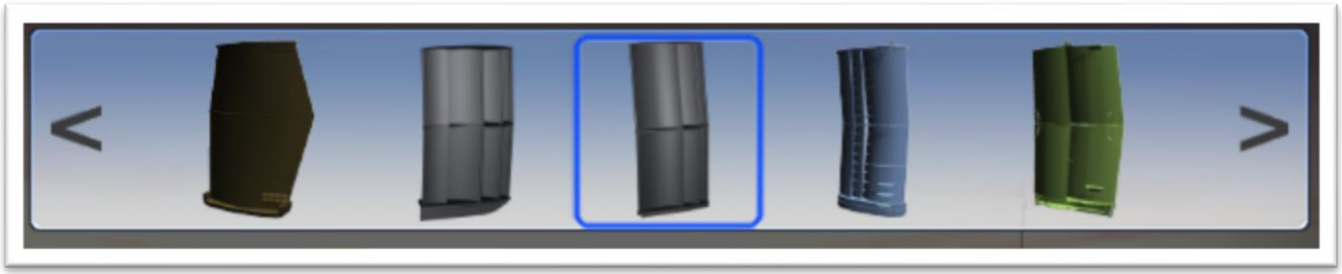


NEW MODELS OF TRAWL DOORS

- Register a new doors model: Thyboron, register hidrodinamic properties and optimal attack angles. You can consider the models: 22, 23 and 24 model.



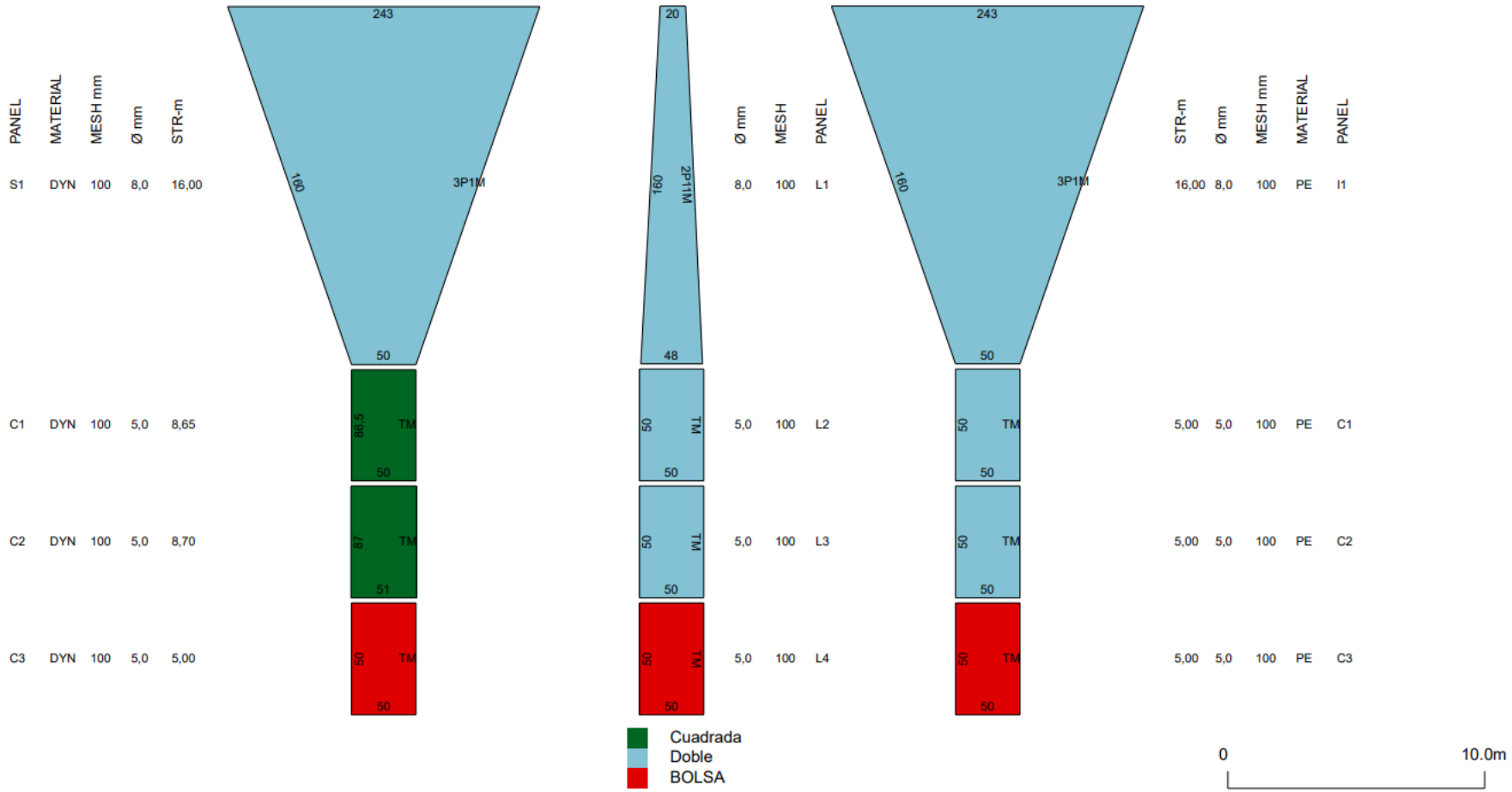
- Italian doors from MORI CARLO´s Company, can be registered, too. They are named: “Panthera” and “Sea Hawk with its hidrodinamic properties and optimal attack angles, as mentioned before.



We update the user interface.

You have created an algorithm that allows us to simulate the performance of the trawl at different depths, from 20 meters to 1500 meters.

THE SOFTWARE ALLOWS THE DESIGN OF THE CODEND AND THEIR SELECTIVITY ANALYSIS



SMART TRAWL