2018 07 24

Hulls examples with Gene-Hull VE & UE 2.3

Gene-Hull VE and UE applications, in their new version 2.3, are tested through the generation of various hulls inspired by existing or historical boats, + the reference boats proposed as a starting point for any new project.

Some are generated from a free interpretation inspired by existing or historical boats (but with modern keel and rudder). The corresponding hulls input data are stored in the « Hulls storage » sheet of each application, so you can reproduce them by copy/paste of the input data column.

With VE application (V type hull) :

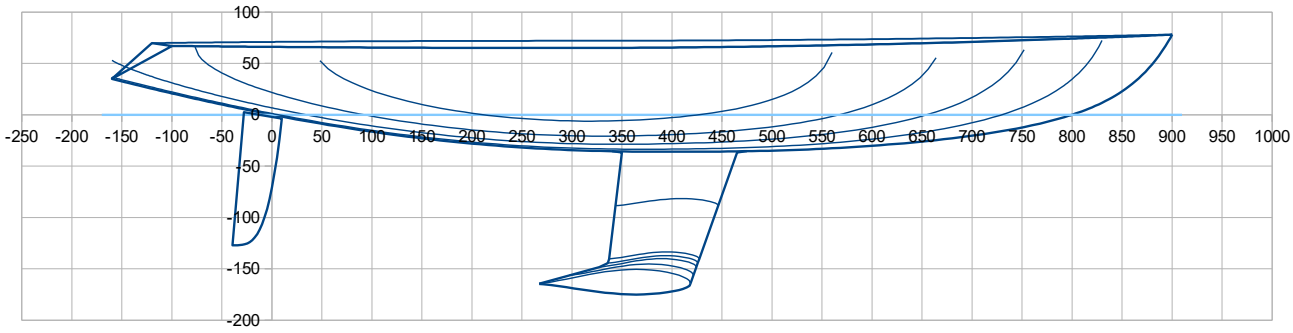
- **VE Reference boat Lwl 8m**
- **B62**, inspired by « Bojar » flush deck cutter 1937 / Johan Anker
- **Classic 6m JI**, inspired by this metric class with a classic approach
- **S30**, inspired by S30 / Knud Reimers
- **T37**, inspired by Tina / Dick Carter
- **Bow42**, tentative with a bow made of round waterlines for better floatation lines of the hull with heel

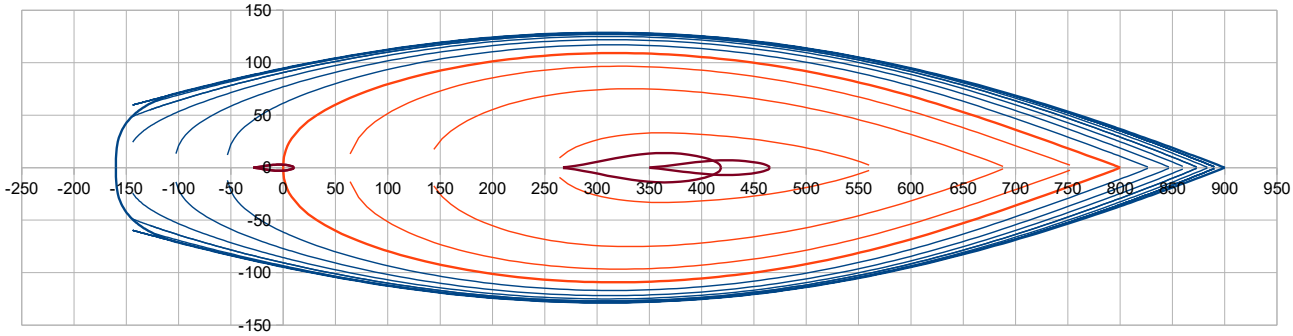
With UE application (U type hull) :

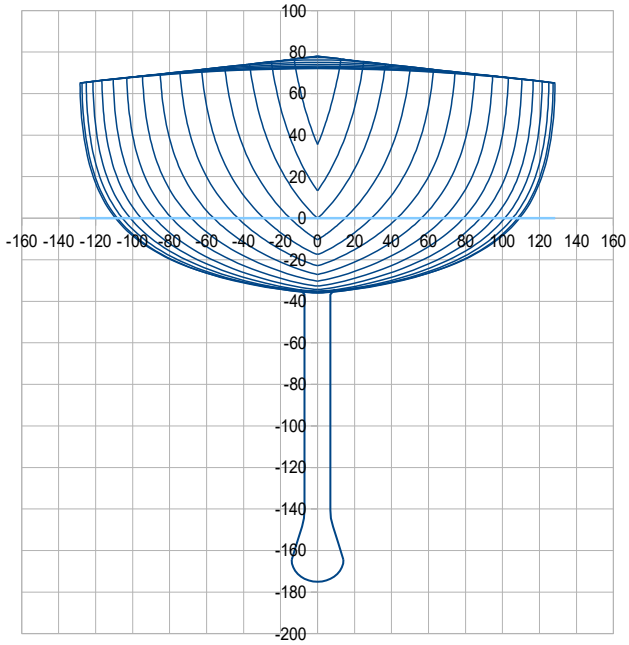
- **UE Reference boat Lwl 8m with hard chine,**
- **UE Reference boat Lwl 8m with hard chine and scow bow,**
- **M32**, inspired by Melges 32 / Reichel Pugh
- **T10**, inspired by Tofinou 10 / Joubert-Nivelt
- **I60 hc**, inspired by Imoca 60 designs
- **D34**, inspired by Delher 34 / Judel-Vrolijk
- **15m2 SNS**, inspired by this switzerland metric class, by Seb Schmidt and Ruedi Stadelman designs.

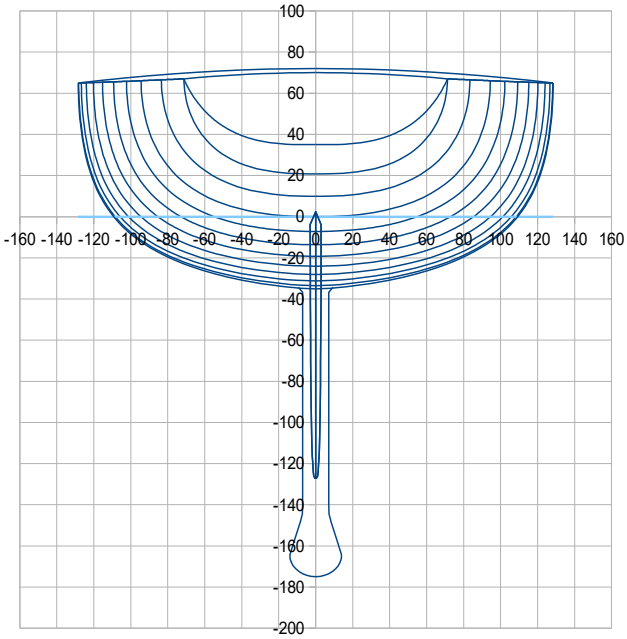
VE Reference boat *with VE 2,3*

Loa 10,60 m ; Lwl 8,00 m ; B 2,57 m ; Draft 1,75 m ; Displacement : 2657 kg ; Keel-bulb 1098 kg

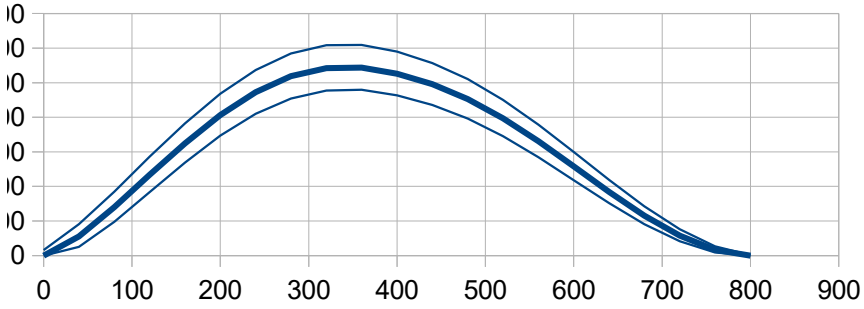








Aeras of sections (at H0, H0 -h, H0 +h)



2. Data sum-up and results of hydrostatic and surfaces calculations

2.1 Hull

Loa (m)	**10,60**	**Lwl (m)**	**8,00**						
>> ft	*34,78*		*26,25*						
B (m)	**2,57**	**at X (% Lwl)**	**38,0**						
>> ft	*8,43*								
Bwl (m)	**2,18**	**at X (% Lwl)**	**40,0**	> Bwl / B	0,850				
>> ft	*7,17*					**Freeboards (m) >**	**Aft**	**Midship**	**Fore**
Tc (m)	**0,36**	**at X (%Lwl)**	**50**				**0,67**	**0,65**	**0,78**
>> ft	*1,18*					*>> ft*	*2,20*	*2,13*	*2,56*
Displacement at H0 (m3)		**2,42789**	**at Xc (m)**	**3,698**	**Xc (%Lwl)**		**46,23**	**Zc (m)**	**-0,125**
	>> lbs	*5486*	*w. seawater*	*1025*	*kg/m3*			*>> ft*	*-0,41*
Disp at h (cm)	-3	2,07176	at Xc (m)	3,719	Xc (%Lwl)		46,49	Zc (m)	-0,114
Disp at h (cm)	3	2,80819	at Xc (m)	3,674	Xc (%Lwl)		45,92	Zc (m)	-0,136
Cp (%)	**55,84**								
Sf (m2)	**12,28**	**at Xf (m)**	**3,552**	**Xf (%Lwl)**	**44,40**		>>> Xc – Xf (%Lwl)		1,83
>> ft2	*132,16*	*>> ft*	*11,65*						
Angle immersed sheer li (°)		**26,9**	at section C4 (40% Lwl)						
Sw (m2)	**13,10**	>Sw/D^(2/3)	7,25						
>> ft2	*141,02*								
Shull (m2)	**29,10**	**at X (m)**	**3,489**	**Z (m)**	**0,063**				
>> ft2	*313,19*	*>> ft*	*11,45*	*>> ft*	*0,21*				
Sdeck (m2)	**18,76**	**at X (m)**	**3,347**						
>> ft2	*201,97*	*>> ft*	*10,98*						

2.2 Keel

Vol. keel(m3)	**0,09626**	**at X (m)**	**4,039**	**X (%Lwl)**	**50,48**	**Z (m)**	**-0,854**
Mass keel(kg)	**702,71**	*>> ft*	*13,25*			*>> ft*	*-2,80*
>> lbs	*1549*						
Vol. Bulb(m3)	**0,05412**	**at X (m)**	**3,675**	**X (%Lwl)**	**45,93**	**Z (m)**	**-1,599**
Mass bulb(kg)	**395,04**	*>> ft*	*12,06*			*>> ft*	*-5,25*
>> lbs	*871*						
Draft oa (m)	**1,75**		**Sw (m2)**	**3,67**		**Sxz (m2)**	**1,37**
>> ft	*5,74*		*>> ft2*	*39,48*		*>> ft2*	*14,70*
LCR (m)	**4,235**	**LCR (%Lwl)**	**52,94**				
>> ft	*13,89*	method : keel profile extended to the waterline, LCR at 25% chord and 45% draft oa					

2.3 Rudder(s)

Number	**1**							
Volume (m3)	**0,01352**	**at X (m)**	**-0,127**	**X (%Lwl)**	**-1,59**	**Z (m)**	**-0,541**	
Sw (m2)	**0,87**	*>> ft*	*-0,42*			**Sxz (m2)**	**0,42**	per rudder
>> ft2	*9,36*					*>> ft2*	*4,50*	

2.4 Hull + Keel + Rudder(s)

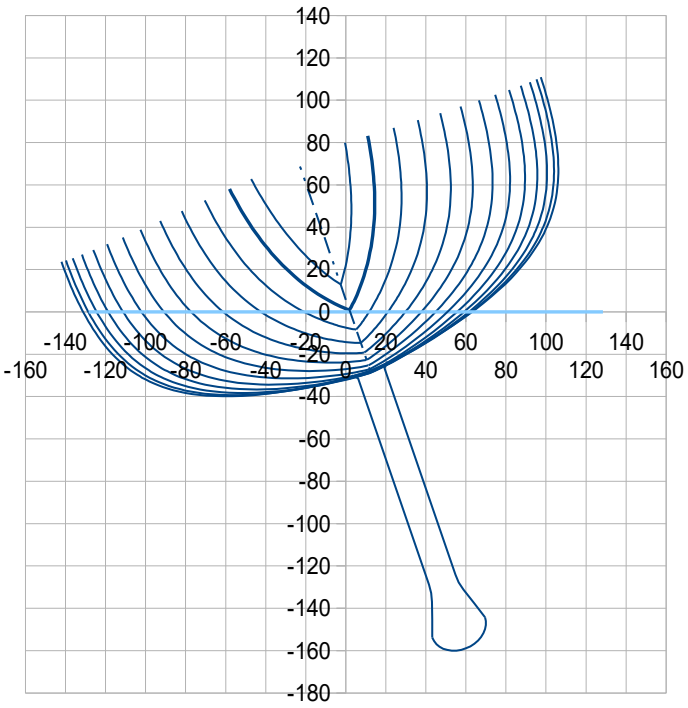
Displacement at H0 (m3)		**2,59178**	**at Xc (m)**	**3,691**	**Xc (%Lwl)**	**46,13**	**at Zc (m)**	**-0,185**
	(kg)	**2657**	*>> ft*	*12,11*			*>> ft*	*-0,61*
	>> lbs	*5857*						
	Ballast (kg)	**1098**	**at Xg (m)**	**3,908**	**Xg (%Lwl)**	**48,85**	**at Zg (m)**	**-1,122**
	>> lbs	*2420*	*>> ft*	*12,82*			*>> ft*	*-3,68*
	>> % Ballast	41,3						
	Sw (m2)	**17,64**	>Sw/D^(2/3)	9,35	Lwl/D^(1/3)	5,82		
	>> ft2	*189,85*			*M/(Lwl/100)^3*	*147*	*tons, feet*	

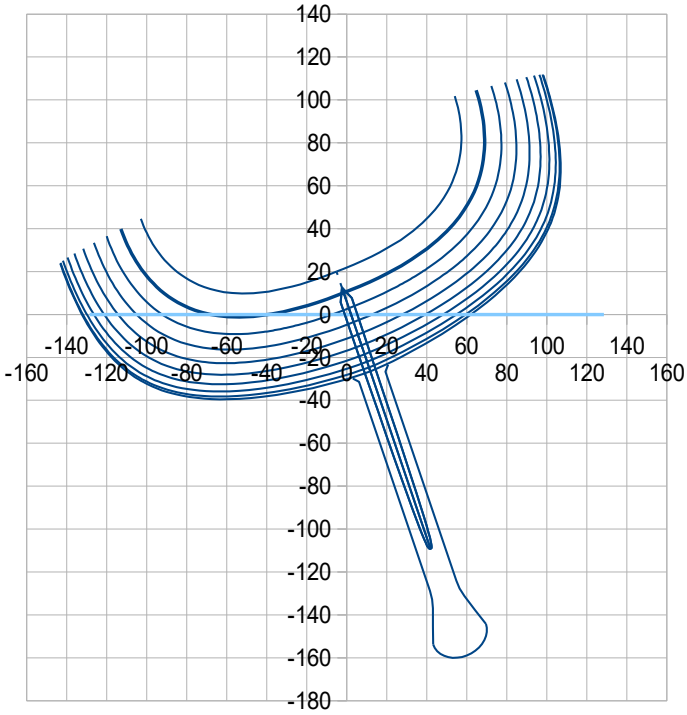
2.5 Data from the mass spreadsheet

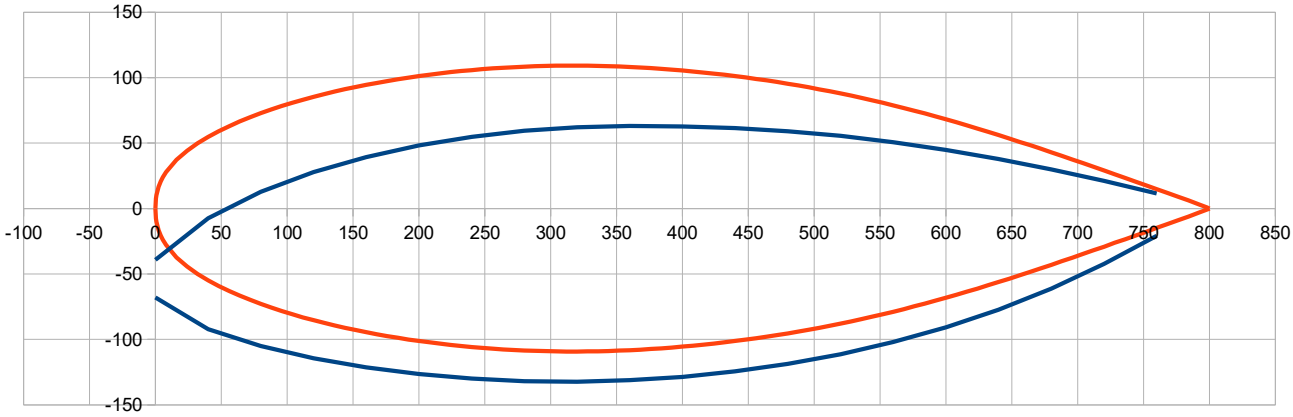
Light boat:	**M (kg)**	**2657**	**at Xg (m)**	**3,745**		**at Zg (m)**	**0,154**

6. Hull-Keel-Rudder with heel

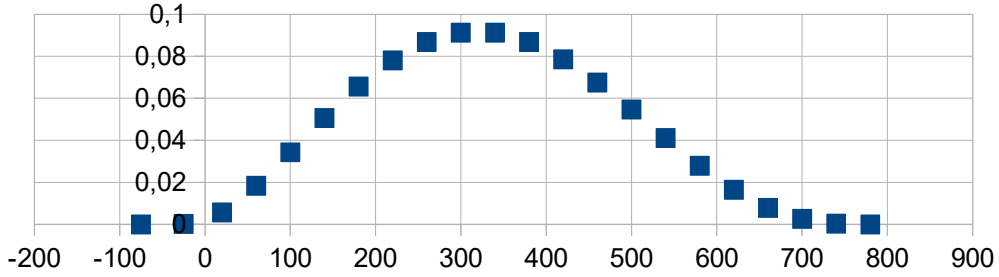
Data to enter		Results for iteration on height and trim		Data to compare with :		Other results for RM and obliquity	
Heel (°)	20,0	Disp. (m3)	2,59244	Mass (kg)	2657,25	Hull Mom(m4)	0,846
Height (cm)	6,2482	Xc heel (m)	3,745	/ Disp. (m3)	2,59244	Mom (kN.m)	8,50
Trim (°)	-0,700	**Other results**		/ Xg (m)	3,745	Yg heel (m)	-0,053
		Yc heel (m)	-0,326	Xc Heel 0°	3,691	>> GZ (m)	0,273
		Zc heel (m)	-0,190	Yc Heel 0°	0,000	RM (kN.m)	7,13
		Sw heel (m2)	16,88	Zc Heel 0°	-0,185	Obliquity (°)	3,18
				Sw Heel 0°	17,64		







Hull Righting Moment (m4) per volumes inter sections



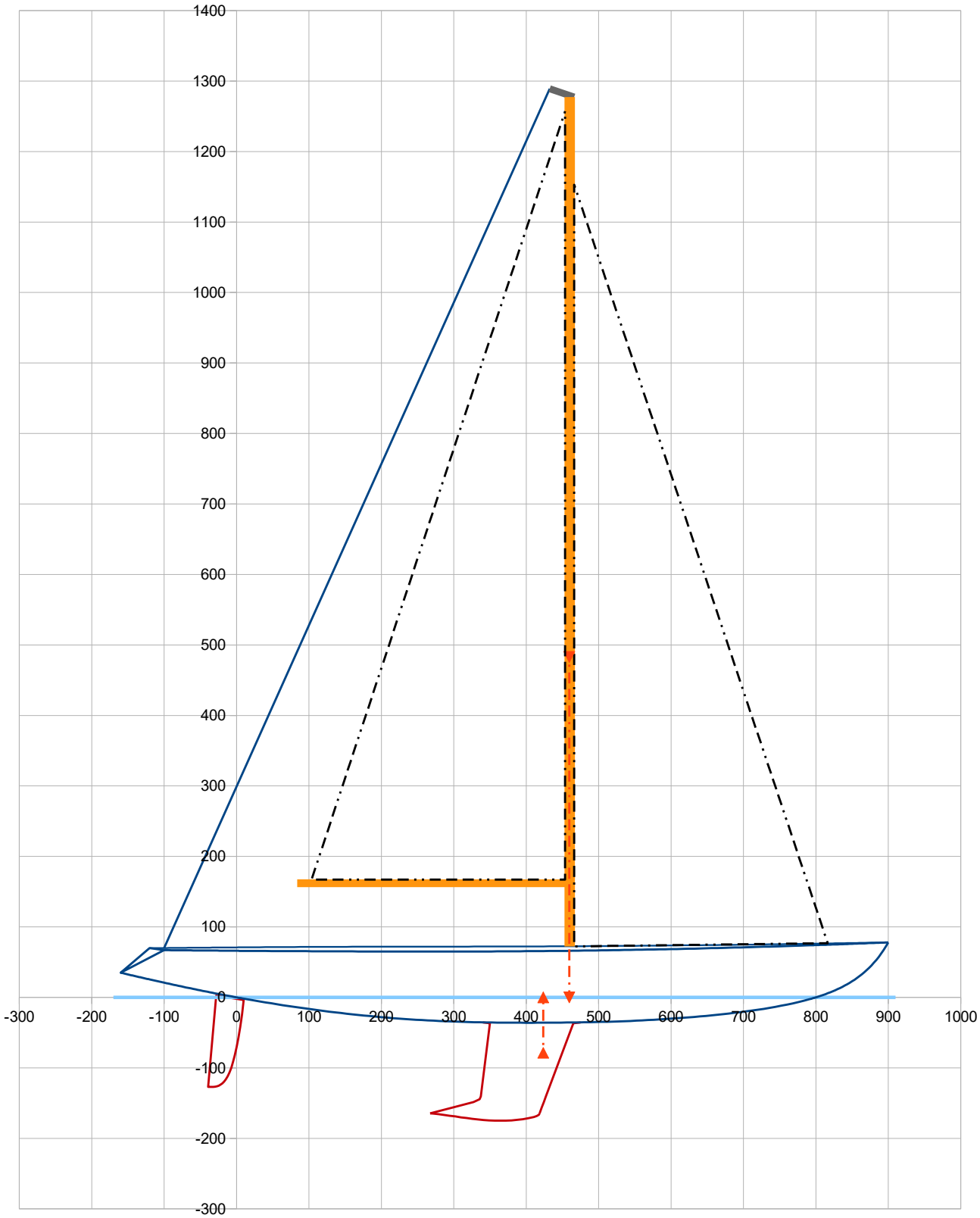
Sailplan – early stage definition

Data to enter		>> in feet
Xmast (m)	**4,60**	*15,09*
Zboom(m)	**1,62**	*5,31*
I (m)	**10,80**	*35,43*
J (m)	**3,50**	*11,48*
P (m)	**10,90**	*35,76*
E (m)	**3,50**	*11,48*

Results for the Sailplan (i.e. Fore + Main triangles)

Geometrical center

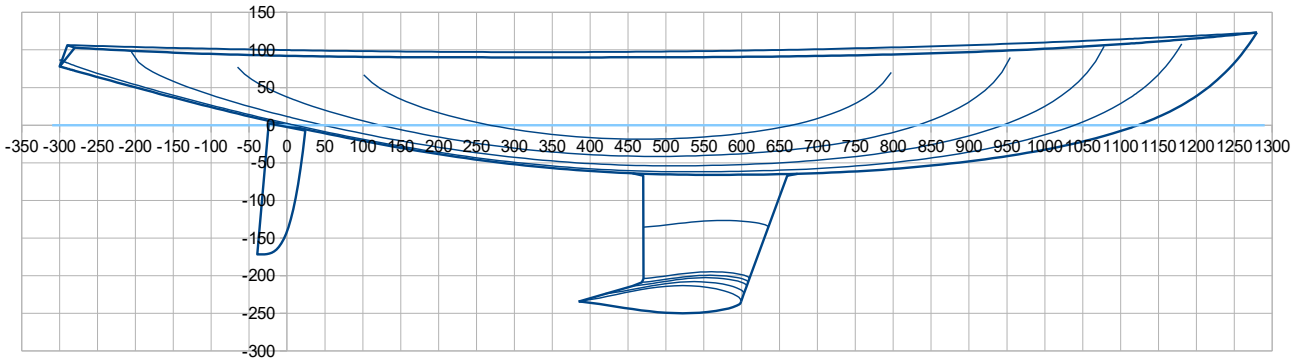
Xv (m)	4,594	Zv (m)	4,830	
Surface triangles St (m2)		**37,98**	*408,76*	*sqft*
>> St / Sw		2,15		
>> St / D^(2/3)		20,13		
>> Skeel / St (%)		3,60		
>> Srudder / St (%)		1,10		
Lead (Xv – LCR) (% Lwl)		**4,5**		

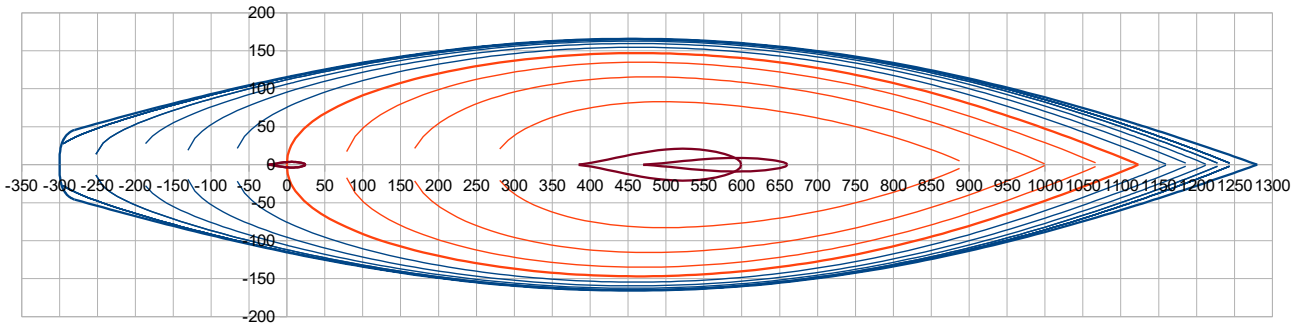


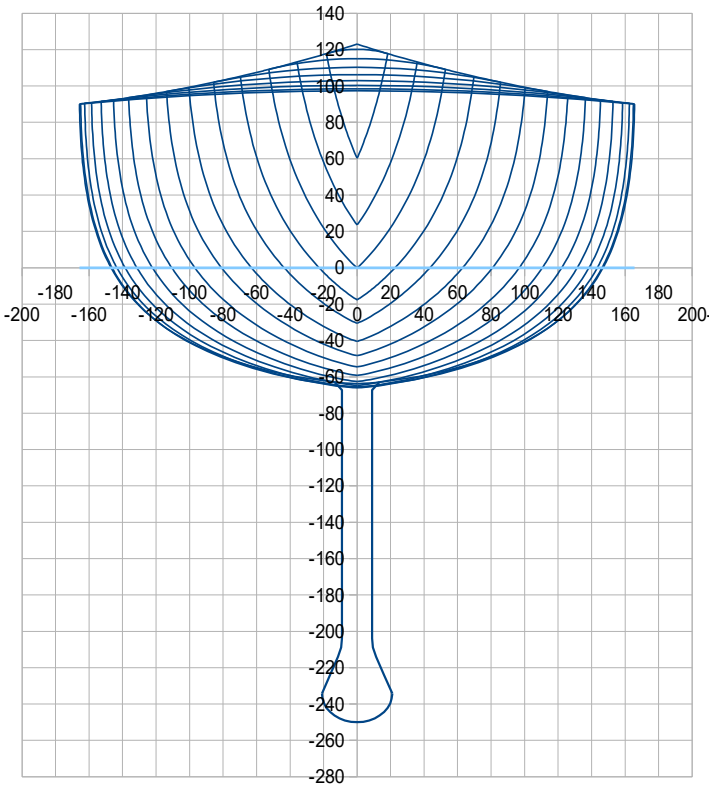
Mass and Xg, Zg position – early stage estimation	**Input data**		**Results**				
Data from Gene-Hull sheet are in blue	**L or S or V**	**mass unit**	**Mass**	**Xg**	M Xg	**Zg**	M Zg
Data to enter are in black (inc. default value to initiate)	m or m2 or m3	**or % Disp.**	**(kg)**	**(m)**		**(m)**	
Hull (skin, structure, keel interface)	29,10	**18,00**	523,74	3,49	1827,17	0,06	32,97
, with S, Xs and Zs from Gene-Hull sheet		(kg/m2)					
Deck – roof – cockpit (skin and structure)	18,76	**14,00**	262,69	3,35	879,30	0,72	189,14
, with S, Xs and Zs from Gene-Hull sheet		(kg/m2)					
Rig, sails and deck fittings		**15,00**	398,49	**4,00**	1593,95	**3,50**	1394,70
		(% Disp.)					
Cabin accomodation and motor		**13,00**	345,35	**3,95**	1364,15	**0,12**	41,44
		(% Disp.)					
Keel			1097,76	3,91	4289,69	-1,12	-1232,01
Rudder		**1,10**	29,22	-0,13	-3,72	-0,54	-15,80
		(% Disp.)					
	Results : Light weight boat >>>		**2657,25**	**3,74**	9950,53	**0,15**	410,44

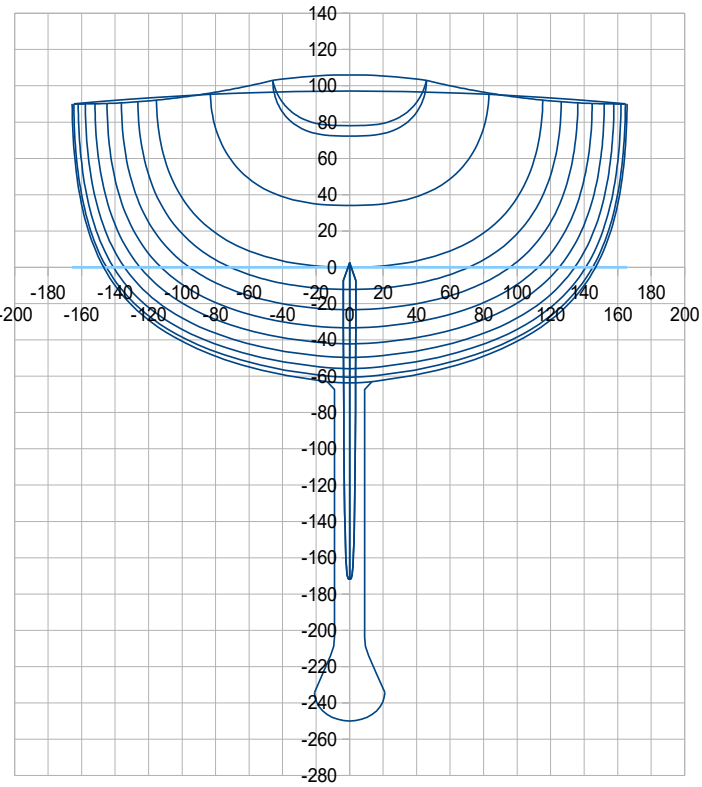
B62 , inspired by « Bojar » flush deck cutter 1937/ Johan Anker *with VE 2,3*

Loa 15,80 m ; Lwl 11,23 m ; B 3,31 m ; Draft 2,50 m ; Keel-bulb 3037 kg ; Displacement : 9132 kg









2. Data sum-up and results of hydrostatic and surfaces calculations

2.1 Hull

Loa (m)	**15,80**	**Lwl (m)**	**11,23**					
>> ft	*51,84*		*36,84*					
B (m)	**3,31**	**at X (% Lwl)**	**40,0**					
>> ft	*10,87*							
Bwl (m)	**2,94**	**at X (% Lwl)**	**41,0**	> Bwl / B	0,887			
>> ft	*9,64*				**Freeboards (m) >**	**Aft**	**Midship**	**Fore**
Tc (m)	**0,66**	**at X (%Lwl)**	**50**			**1,03**	**0,90**	**1,23**
>> ft	*2,17*				*>> ft*	*3,38*	*2,95*	*4,04*
Displacement at H0 (m3)	**8,46419**		**at Xc (m)**	**5,279**	**Xc (%Lwl)**	**47,01**	**Zc (m)**	**-0,228**
>> lbs	*19127*		*w. seawater*	*1025*	*kg/m3*		*>> ft*	*-0,75*
Disp at h (cm)	-3	7,77546	at Xc (m)	5,294	Xc (%Lwl)	47,14	Zc (m)	-0,217
Disp at h (cm)	3	9,18562	at Xc (m)	5,257	Xc (%Lwl)	46,81	Zc (m)	-0,239
Cp (%)	**55,27**							
Sf (m2)	**23,45**	**at Xf (m)**	**5,075**	**Xf (%Lwl)**	**45,19**	>>> Xc – Xf (%Lwl)		1,82
>> ft2	*252,45*	*>> ft*	*16,65*					
Angle immersed sheer li (°)	**28,5**	at section C4 (40% Lwl)						
Sw (m2)	**26,25**	>Sw/D^(2/3)	6,32					
>> ft2	*282,60*							
Shull (m2)	**58,00**	**at X (m)**	**4,831**	**Z (m)**	**0,065**			
>> ft2	*624,26*	*>> ft*	*15,85*	*>> ft*	*0,21*			
Sdeck (m2)	**35,85**	**at X (m)**	**4,495**					
>> ft2	*385,87*	*>> ft*	*14,75*					

2.2 Keel

Vol. keel(m3)	**0,26205**	**at X (m)**	**5,669**	**X (%Lwl)**	**50,48**	**Z (m)**	**-1,304**	
Mass keel(kg)	**1912,93**	*>> ft*	*18,60*			*>> ft*	*-4,28*	
>> lbs	*4217*							
Vol. Bulb(m3)	**0,15396**	**at X (m)**	**5,241**	**X (%Lwl)**	**46,67**	**Z (m)**	**-2,295**	
Mass bulb(kg)	**1123,94**	*>> ft*	*17,20*			*>> ft*	*-7,53*	
>> lbs	*2478*							
Draft oa (m)	**2,50**		**Sw (m2)**	**7,62**		**Sxz (m2)**	**2,84**	
>> ft	*8,20*		*>> ft2*	*82,02*		*>> ft2*	*30,62*	
LCR (m)	**6,002**	**LCR (%Lwl)**	**53,45**					
>> ft	*19,69*	method : keel profile extended to the waterline, LCR at 25% chord and 45% draft oa						

2.3 Rudder(s)

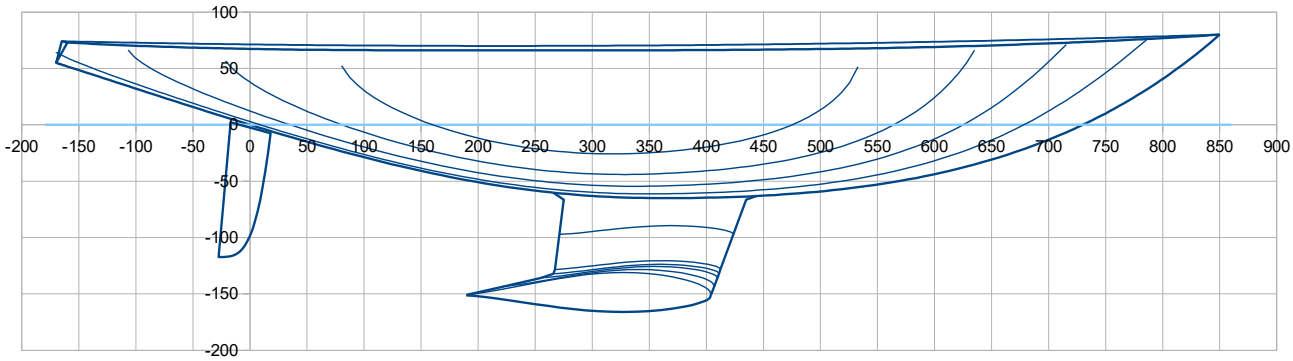
Number	**1**							
Volume (m3)	**0,02924**	**at X (m)**	**-0,051**	**X (%Lwl)**	**-0,45**	**Z (m)**	**-0,746**	
Sw (m2)	**1,48**	*>> ft*	*-0,17*			**Sxz (m2)**	**0,71**	per rudder
>> ft2	*15,98*					*>> ft2*	*7,68*	

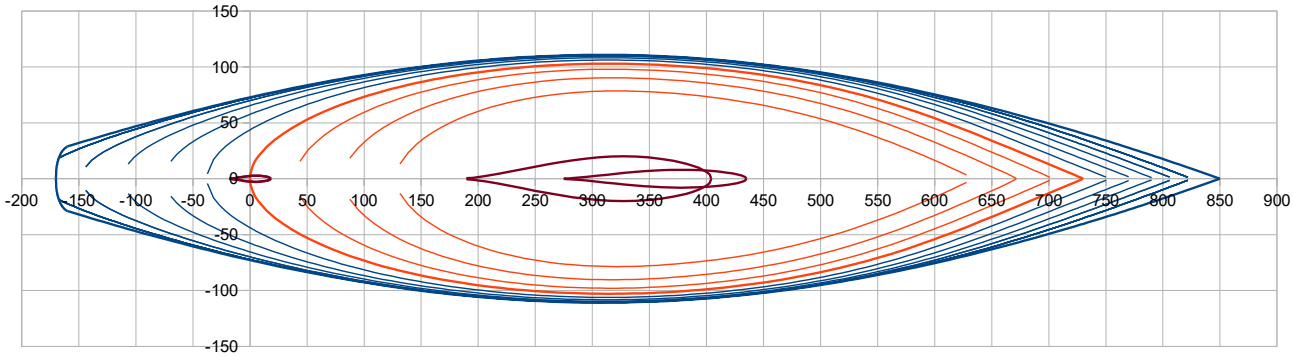
2.4 Hull + Keel + Rudder(s)

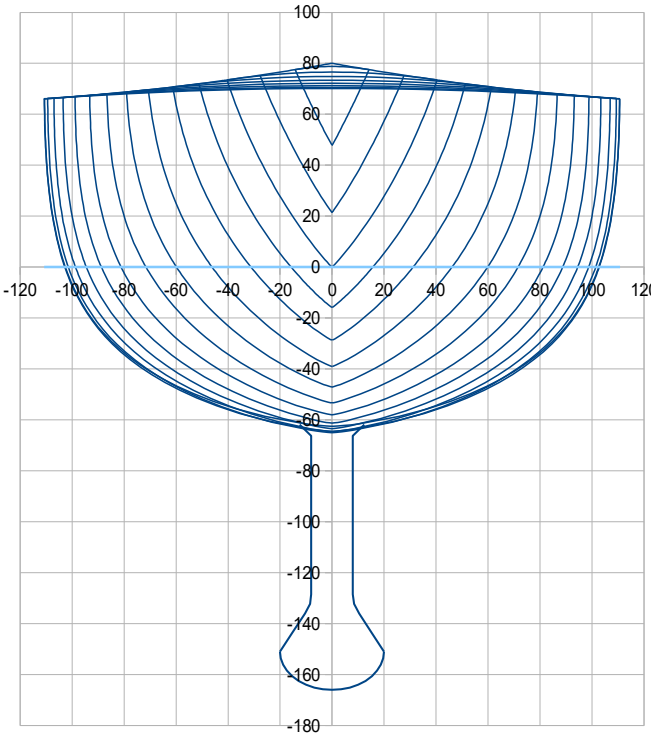
Displacement at H0 (m3)	**8,90944**	**at Xc (m)**	**5,273**	**Xc (%Lwl)**	**46,95**	**at Zc (m)**	**-0,297**	
(kg)	**9132**	*>> ft*	*17,30*			*>> ft*	*-0,97*	
>> lbs	*20133*							
Ballast (kg)	**3037**	**at Xg (m)**	**5,511**	**Xg (%Lwl)**	**49,07**	**at Zg (m)**	**-1,671**	
>> lbs	*6695*	*>> ft*	*18,08*			*>> ft*	*-5,48*	
>> % Ballast	33,3							
Sw (m2)	**35,36**	>Sw/D^(2/3)	8,23	Lwl/D^(1/3)	5,42			
>> ft2	*380,59*			*M/(Lwl/100)^3*	*183*	*tons, feet*		

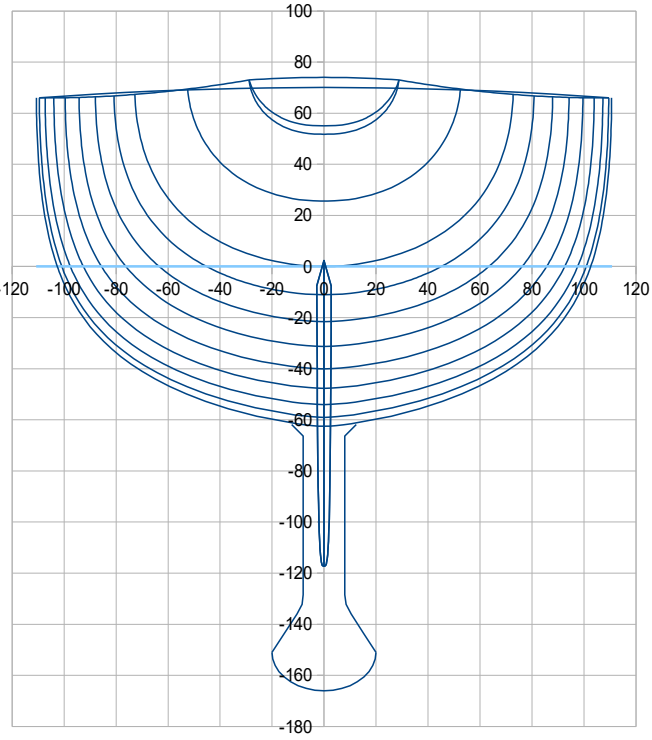
Classic 6m JI, inspired by this metric class and with a classic approach *with VE 2,3*

Loa 10,20 m ; Lwl 7,30 m ; B 2,22 m ; Draft 1,66 m ; Keel-bulb 2069 kg ; Displacement : 4139 kg









2. Data sum-up and results of hydrostatic and surfaces calculations

2.1 Hull

Loa (m)	**10,20**	**Lwl (m)**	**7,30**						
>> ft	*33,46*		*23,95*						
B (m)	**2,22**	**at X (% Lwl)**	**42,0**						
>> ft	*7,27*								
Bwl (m)	**2,06**	**at X (% Lwl)**	**43,0**	> Bwl / B	0,929				
>> ft	*6,75*					**Freeboards (m) >**	**Aft**	**Midship**	**Fore**
Tc (m)	**0,65**	**at X (%Lwl)**	**50**				**0,73**	**0,66**	**0,8**
>> ft	*2,13*					*>> ft*	*2,40*	*2,17*	*2,62*
Displacement at H0 (m3)	**3,81007**	**at Xc (m)**	**3,484**	**Xc (%Lwl)**	**47,72**		**Zc (m)**	**-0,224**	
>> lbs	*8610*	*w. seawater*	*1025*	*kg/m3*			*>> ft*	*-0,73*	
Disp at h (cm)	-3	3,49529	at Xc (m)	3,494	Xc (%Lwl)	47,86	Zc (m)	-0,213	
Disp at h (cm)	3	4,13824	at Xc (m)	3,470	Xc (%Lwl)	47,54	Zc (m)	-0,235	
Cp (%)	**54,53**								
Sf (m2)	**10,70**	**at Xf (m)**	**3,355**	**Xf (%Lwl)**	**45,95**		>>> Xc – Xf (%Lwl)	1,77	
>> ft2	*115,22*	*>> ft*	*11,01*						
Angle immersed sheer li (°)	**30,8**	at section C4 (40% Lwl)							
Sw (m2)	**13,04**	>Sw/D^(2/3)	5,34						
>> ft2	*140,33*								
Shull (m2)	**27,00**	**at X (m)**	**3,291**	**Z (m)**	**-0,002**				
>> ft2	*290,62*	*>> ft*	*10,80*	*>> ft*	*-0,01*				
Sdeck (m2)	**15,42**	**at X (m)**	**3,104**						
>> ft2	*165,95*	*>> ft*	*10,19*						

2.2 Keel

Vol. keel(m3)	**0,09808**	**at X (m)**	**3,598**	**X (%Lwl)**	**49,29**	**Z (m)**	**-0,966**
Mass keel(kg)	**716,02**	*>> ft*	*11,80*			*>> ft*	*-3,17*
>> lbs	*1579*						
Vol. Bulb(m3)	**0,11922**	**at X (m)**	**3,274**	**X (%Lwl)**	**44,84**	**Z (m)**	**-1,489**
Mass bulb(kg)	**1353,13**	*>> ft*	*10,74*			*>> ft*	*-4,88*
>> lbs	*2983*						
Draft oa (m)	**1,66**		**Sw (m2)**	**4,54**		**Sxz (m2)**	**1,41**
>> ft	*5,45*		*>> ft2*	*48,82*		*>> ft2*	*15,19*
LCR (m)	**3,924**	**LCR (%Lwl)**	**53,76**				
>> ft	*12,88*	method : keel profile extended to the waterline, LCR at 25% chord and 45% draft oa					

2.3 Rudder(s)

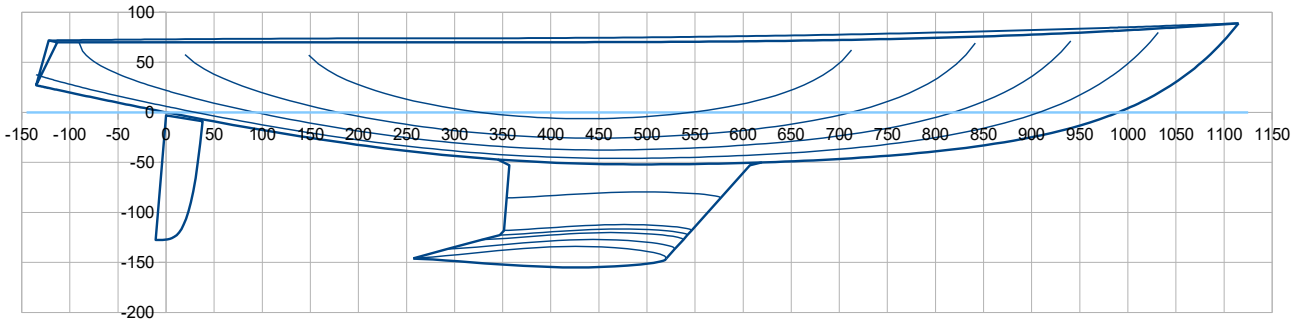
Number	**1**							
Volume (m3)	**0,01034**	**at X (m)**	**-0,030**	**X (%Lwl)**	**-0,41**	**Z (m)**	**-0,521**	
Sw (m2)	**0,73**	*>> ft*	*-0,10*			**Sxz (m2)**	**0,35**	per rudder
>> ft2	*7,88*					*>> ft2*	*3,79*	

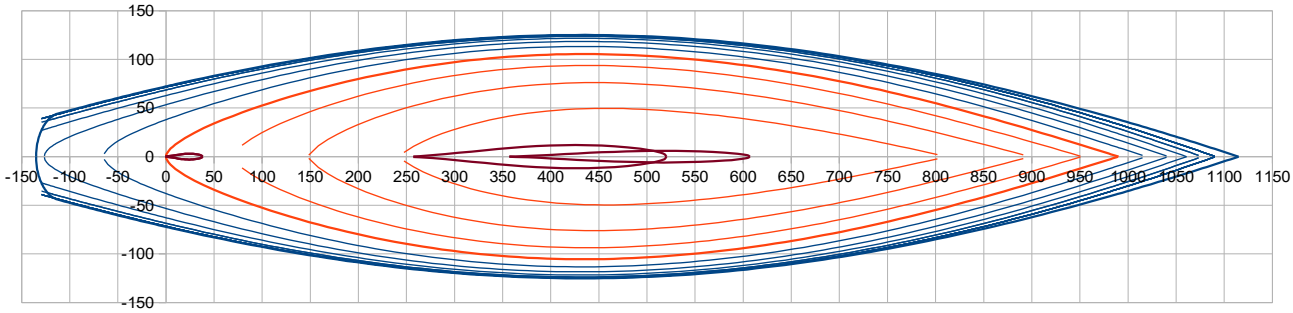
2.4 Hull + Keel + Rudder(s)

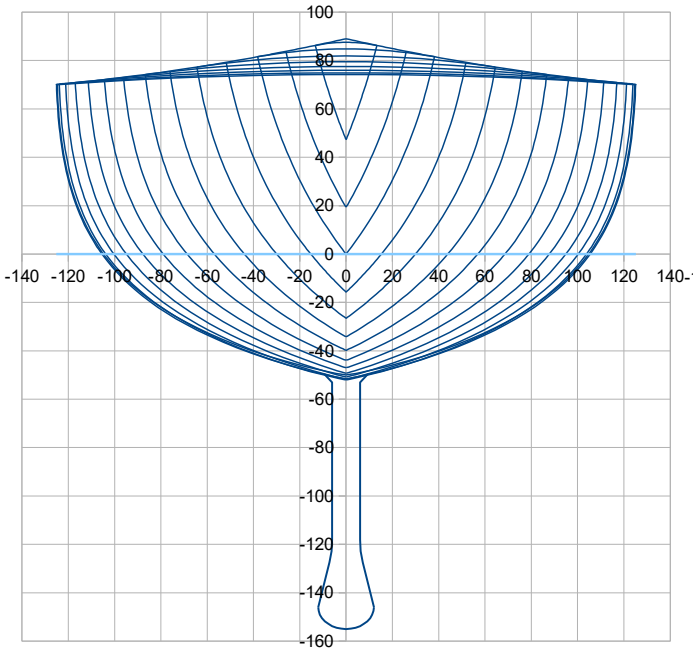
Displacement at H0 (m3)	**4,03771**	**at Xc (m)**	**3,471**	**Xc (%Lwl)**	**47,55**	**at Zc (m)**	**-0,280**
(kg)	**4139**	*>> ft*	*11,39*			*>> ft*	*-0,92*
>> lbs	*9124*						
Ballast (kg)	**2069**	**at Xg (m)**	**3,386**	**Xg (%Lwl)**	**46,38**	**at Zg (m)**	**-1,308**
>> lbs	*4562*	*>> ft*	*11,11*			*>> ft*	*-4,29*
>> % Ballast	50,0						
Sw (m2)	**18,30**	>Sw/D^(2/3)	7,22	Lwl/D^(1/3)	4,58		
>> ft2	*197,02*			*M/(Lwl/100)^3*	*301*	*tons, feet*	

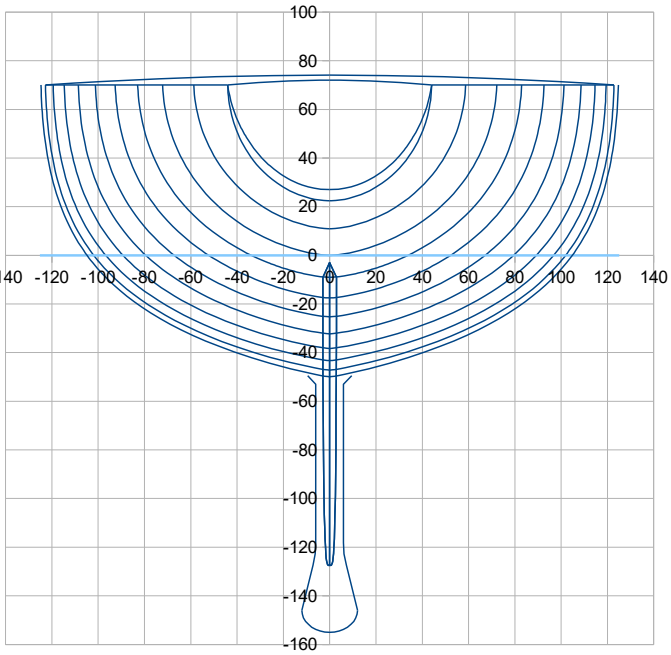
S30, inspired by S30 / Knud Reimers *with VE 2,3*

Loa 12,5 m ; Lwl 9,90 m ; B 2,50 m ; Draft 1,55 m ; Keel-bulb 1499 kg ; Displacement : 4043 kg









2. Data sum-up and results of hydrostatic and surfaces calculations

2.1 Hull

Loa (m)	**12,50**	**Lwl (m)**	**9,90**					
>> ft	*41,01*		*32,48*					
B (m)	**2,50**	**at X (% Lwl)**	**44,0**					
>> ft	*8,21*							
Bwl (m)	**2,11**	**at X (% Lwl)**	**44,0**	> Bwl / B	0,843			
>> ft	*6,92*				**Freeboards (m) >**	**Aft**	**Midship**	**Fore**
Tc (m)	**0,52**	**at X (%Lwl)**	**50**			**0,7**	**0,70**	**0,89**
>> ft	*1,71*				*>> ft*	*2,30*	*2,30*	*2,92*
Displacement at H0 (m3)	**3,72536**	**at Xc (m)**	**4,794**	**Xc (%Lwl)**	**48,43**	**Zc (m)**	**-0,171**	
>> lbs	*8418*	*w. seawater*	*1025*	*kg/m3*		*>> ft*	*-0,56*	
Disp at h (cm)	-3	3,31484	at Xc (m)	4,812	Xc (%Lwl)	48,61	Zc (m)	-0,160
Disp at h (cm)	3	4,15630	at Xc (m)	4,774	Xc (%Lwl)	48,23	Zc (m)	-0,182
Cp (%)	**53,40**							
Sf (m2)	**14,04**	**at Xf (m)**	**4,627**	**Xf (%Lwl)**	**46,73**	>>> Xc – Xf (%Lwl)		1,69
>> ft2	*151,14*	*>> ft*	*15,18*					
Angle immersed sheer li (°)	**29,3**	at section C4 (40% Lwl)						
Sw (m2)	**16,03**	>Sw/D^(2/3)	6,67					
>> ft2	*172,49*							
Shull (m2)	**35,24**	**at X (m)**	**4,671**	**Z (m)**	**0,059**			
>> ft2	*379,33*	*>> ft*	*15,32*	*>> ft*	*0,19*			
Sdeck (m2)	**21,58**	**at X (m)**	**4,454**					
>> ft2	*232,34*	*>> ft*	*14,61*					

2.2 Keel

Vol. keel(m3)	**0,11235**	**at X (m)**	**4,843**	**X (%Lwl)**	**48,92**	**Z (m)**	**-0,836**	
Mass keel(kg)	**820,16**	*>> ft*	*15,89*			*>> ft*	*-2,74*	
>> lbs	*1808*							
Vol. Bulb(m3)	**0,09304**	**at X (m)**	**4,302**	**X (%Lwl)**	**43,46**	**Z (m)**	**-1,385**	
Mass bulb(kg)	**679,17**	*>> ft*	*14,12*			*>> ft*	*-4,55*	
>> lbs	*1497*							
Draft oa (m)	**1,55**		**Sw (m2)**	**5,63**		**Sxz (m2)**	**2,16**	
>> ft	*5,09*		*>> ft2*	*60,61*		*>> ft2*	*23,28*	
LCR (m)	**5,324**	**LCR (%Lwl)**	**53,78**					
>> ft	*17,47*	method : keel profile extended to the waterline, LCR at 25% chord and 45% draft oa						

2.3 Rudder(s)

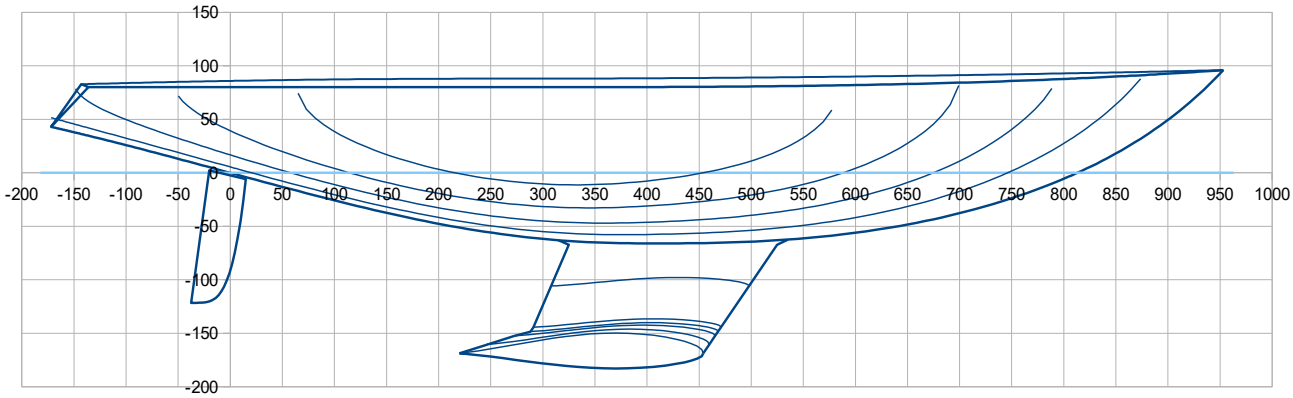
Number	**1**							
Volume (m3)	**0,01369**	**at X (m)**	**0,156**	**X (%Lwl)**	**1,58**	**Z (m)**	**-0,589**	
Sw (m2)	**0,86**	*>> ft*	*0,51*			**Sxz (m2)**	**0,41**	per rudder
>> ft2	*9,25*					*>> ft2*	*4,45*	

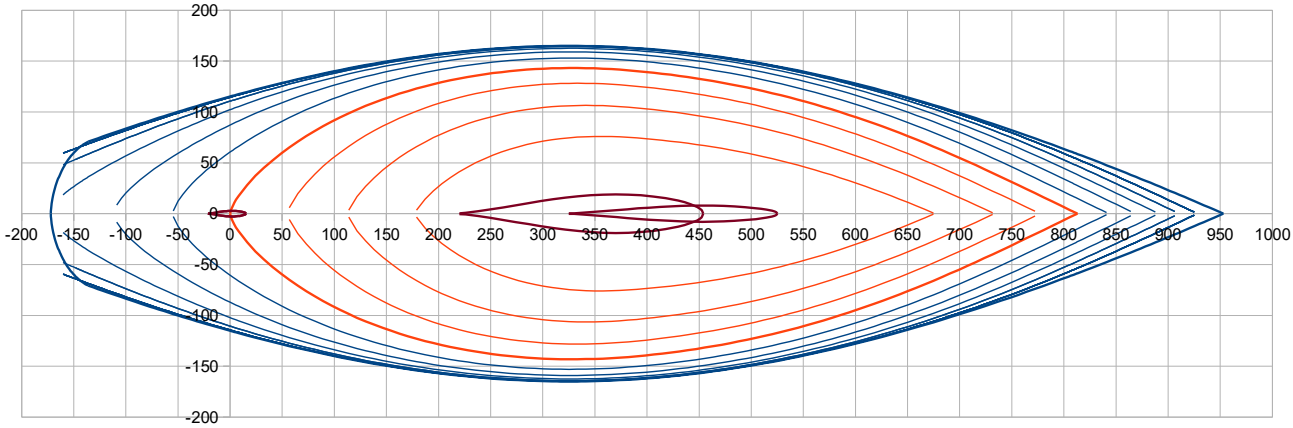
2.4 Hull + Keel + Rudder(s)

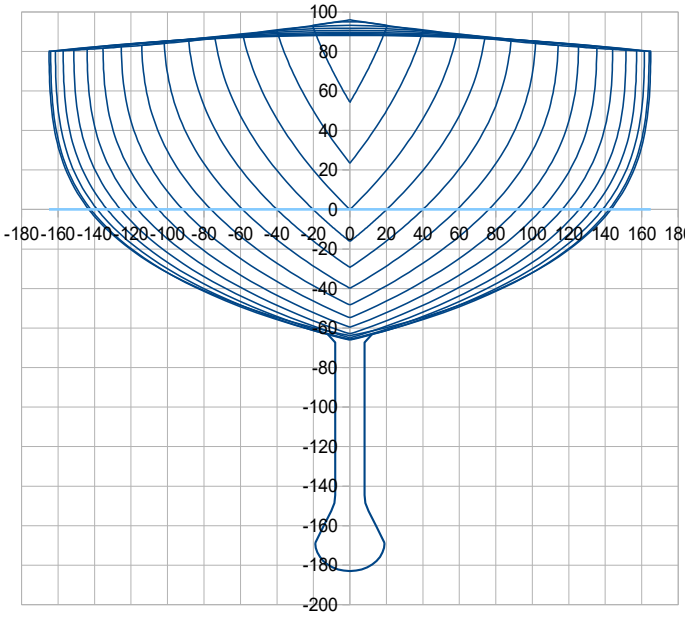
Displacement at H0 (m3)	**3,94443**	**at Xc (m)**	**4,768**	**Xc (%Lwl)**	**48,16**	**at Zc (m)**	**-0,220**	
(kg)	**4043**	*>> ft*	*15,64*			*>> ft*	*-0,72*	
>> lbs	*8913*							
Ballast (kg)	**1499**	**at Xg (m)**	**4,598**	**Xg (%Lwl)**	**46,45**	**at Zg (m)**	**-1,085**	
>> lbs	*3305*	*>> ft*	*15,09*			*>> ft*	*-3,56*	
>> % Ballast	37,1							
Sw (m2)	**22,52**	>Sw/D^(2/3)	9,02	Lwl/D^(1/3)	6,27			
>> ft2	*242,35*			*M/(Lwl/100)^3*	*118*	*tons, feet*		

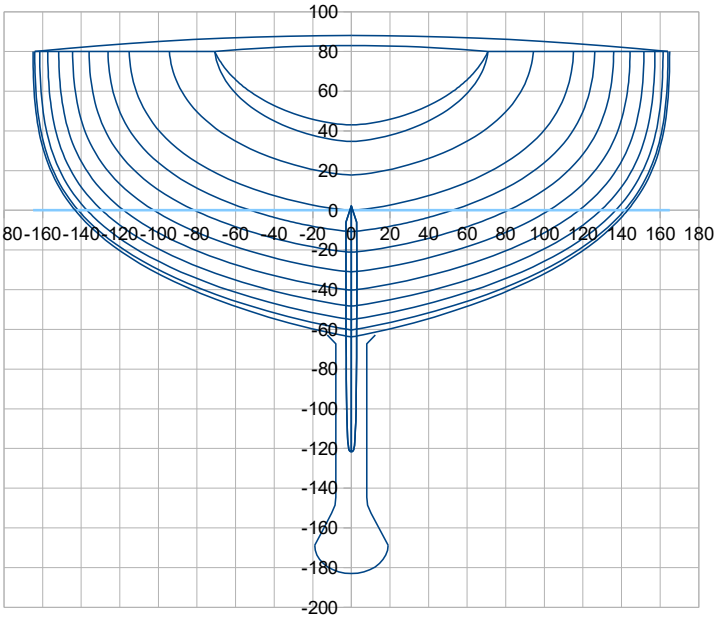
T37, inspired by Tina / Dick Carter *with VE 2,3*

Loa 11,25 m ; Lwl 8,13 m ; B 3,30 m ; TE 1,83 m ; Keel-bulb 2614 kg ; Displacement : 5598 kg









2. Data sum-up and results of hydrostatic and surfaces calculations

2.1 Hull

Loa (m)	**11,25**	**Lwl (m)**	**8,13**					
>> ft	*36,91*		*26,67*					
B (m)	**3,30**	**at X (% Lwl)**	**40,0**					
>> ft	*10,82*							
Bwl (m)	**2,86**	**at X (% Lwl)**	**40,0**	> Bwl / B	0,868			
>> ft	*9,39*				**Freeboards (m) >**	**Aft**	**Midship**	**Fore**
Tc (m)	**0,66**	**at X (%Lwl)**	**50**			**0,8**	**0,80**	**0,96**
>> ft	*2,17*				*>> ft*	*2,62*	*2,62*	*3,15*
Displacement at H0 (m3)	**5,16400**	**at Xc (m)**	**3,866**	**Xc (%Lwl)**	**47,55**	**Zc (m)**	**-0,213**	
>> lbs	*11669*	*w. seawater*	*1025*	*kg/m3*		*>> ft*	*-0,70*	
Disp at h (cm)	-3	4,69648	at Xc (m)	3,879	Xc (%Lwl)	47,71	Zc (m)	-0,202
Disp at h (cm)	3	5,65292	at Xc (m)	3,851	Xc (%Lwl)	47,37	Zc (m)	-0,223
Cp (%)	**53,84**							
Sf (m2)	**15,95**	**at Xf (m)**	**3,719**	**Xf (%Lwl)**	**45,74**	>>> Xc – Xf (%Lwl)		1,81
>> ft2	*171,66*	*>> ft*	*12,20*					
Angle immersed sheer li (°)	**25,9**	at section C4 (40% Lwl)						
Sw (m2)	**17,77**	>Sw/D^(2/3)	5,95					
>> ft2	*191,23*							
Shull (m2)	**38,24**	**at X (m)**	**3,627**	**Z (m)**	**0,036**			
>> ft2	*411,56*	*>> ft*	*11,90*	*>> ft*	*0,12*			
Sdeck (m2)	**25,38**	**at X (m)**	**3,464**					
>> ft2	*273,15*	*>> ft*	*11,36*					

2.2 Keel

Vol. keel(m3)	**0,15162**	**at X (m)**	**4,187**	**X (%Lwl)**	**51,51**	**Z (m)**	**-1,049**	
Mass keel(kg)	**1106,79**	*>> ft*	*13,74*			*>> ft*	*-3,44*	
>> lbs	*2440*							
Vol. Bulb(m3)	**0,13282**	**at X (m)**	**3,698**	**X (%Lwl)**	**45,49**	**Z (m)**	**-1,651**	
Mass bulb(kg)	**1507,55**	*>> ft*	*12,13*			*>> ft*	*-5,42*	
>> lbs	*3324*							
Draft oa (m)	**1,83**		**Sw (m2)**	**5,91**		**Sxz (m2)**	**2,08**	
>> ft	*6,00*		*>> ft2*	*63,60*		*>> ft2*	*22,42*	
LCR (m)	**4,654**	**LCR (%Lwl)**	**57,25**					
>> ft	*15,27*	method : keel profile extended to the waterline, LCR at 25% chord and 45% draft oa						

2.3 Rudder(s)

Number	**1**							
Volume (m3)	**0,01312**	**at X (m)**	**-0,082**	**X (%Lwl)**	**-1,01**	**Z (m)**	**-0,570**	
Sw (m2)	**0,84**	*>> ft*	*-0,27*			**Sxz (m2)**	**0,40**	per rudder
>> ft2	*9,06*					*>> ft2*	*4,35*	

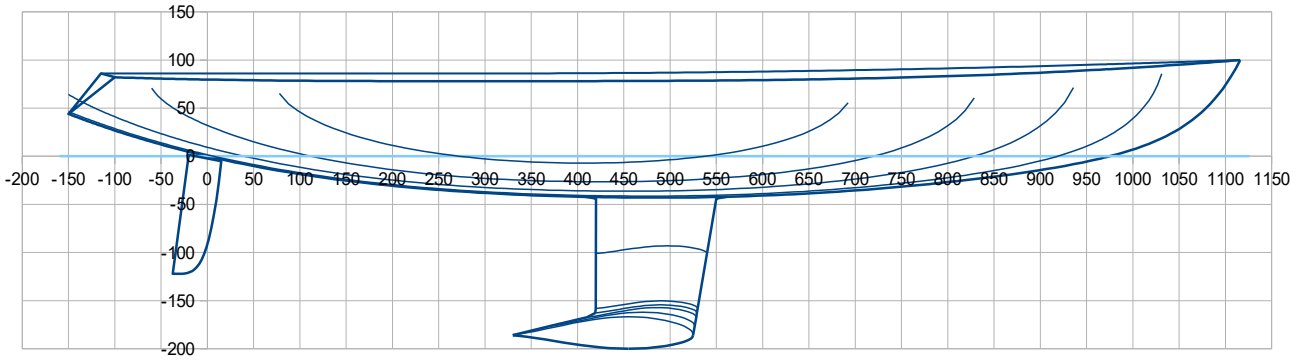
2.4 Hull + Keel + Rudder(s)

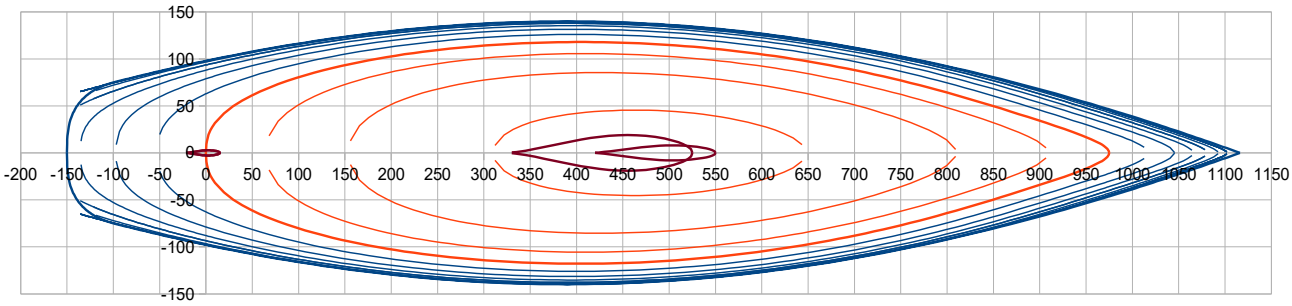
Displacement at H0 (m3)	**5,46156**	**at Xc (m)**	**3,861**	**Xc (%Lwl)**	**47,50**	**at Zc (m)**	**-0,272**
(kg)	**5598**	*>> ft*	*12,67*			*>> ft*	*-0,89*
>> lbs	*12342*						
Ballast (kg)	**2614**	**at Xg (m)**	**3,905**	**Xg (%Lwl)**	**48,04**	**at Zg (m)**	**-1,396**
>> lbs	*5764*	*>> ft*	*12,81*			*>> ft*	*-4,58*
>> % Ballast	46,7						
Sw (m2)	**24,52**	>Sw/D^(2/3)	7,90	Lwl/D^(1/3)	4,62		
>> ft2	*263,88*			*M/(Lwl/100)^3*	*295*	*tons, feet*	

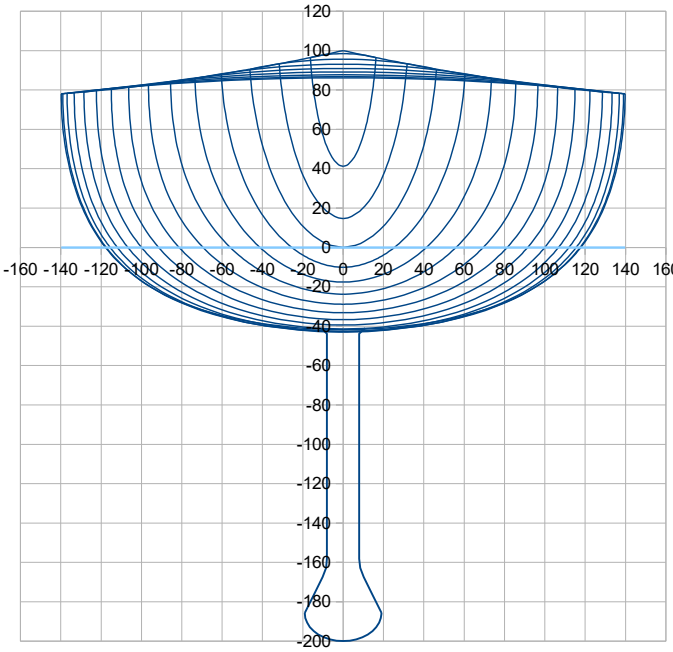
Bow42, tentative with a bow made of round waterlines for better floatation lines of the hull with heel

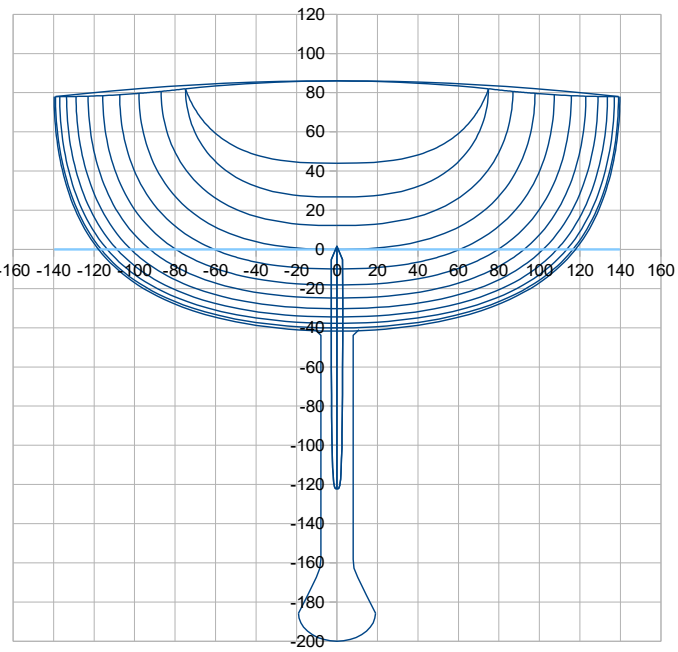
with VE 2,3

Loa 12,66 m ; Lwl 9,75 m ; B 2,80 m ; Draft 2,00 m ; Keel-bulb 2279 kg ; Displacement : 4514 kg









2. Data sum-up and results of hydrostatic and surfaces calculations

2.1 Hull

Loa (m)	**12,66**	**Lwl (m)**	**9,75**						
>> ft	*41,54*		*31,99*						
B (m)	**2,80**	**at X (% Lwl)**	**40,0**						
>> ft	*9,17*								
Bwl (m)	**2,36**	**at X (% Lwl)**	**41,0**	> Bwl / B	0,844				
>> ft	*7,74*					**Freeboards (m) >**	**Aft**	**Midship**	**Fore**
Tc (m)	**0,43**	**at X (%Lwl)**	**50**				**0,82**	**0,78**	**1**
>> ft	*1,41*					*>> ft*	*2,69*	*2,56*	*3,28*
Displacement at H0 (m3)	**4,13965**	**at Xc (m)**	**4,554**	**Xc (%Lwl)**	**46,71**		**Zc (m)**	**-0,153**	
>> lbs	*9354*	*w. seawater*	*1025*	*kg/m3*			*>> ft*	*-0,50*	
Disp at h (cm)	-3	3,64884	at Xc (m)	4,564	Xc (%Lwl)	46,81	Zc (m)	-0,142	
Disp at h (cm)	3	4,65672	at Xc (m)	4,542	Xc (%Lwl)	46,58	Zc (m)	-0,164	
Cp (%)	**57,65**								
Sf (m2)	**16,84**	**at Xf (m)**	**4,460**	**Xf (%Lwl)**	**45,74**	>>> Xc – Xf (%Lwl)		0,97	
>> ft2	*181,25*	*>> ft*	*14,63*						
Angle immersed sheer li (°)	**29,2**	at section C4 (40% Lwl)							
Sw (m2)	**18,18**	>Sw/D^(2/3)	7,05						
>> ft2	*195,66*								
Shull (m2)	**40,20**	**at X (m)**	**4,501**	**Z (m)**	**0,080**				
>> ft2	*432,69*	*>> ft*	*14,77*	*>> ft*	*0,26*				
Sdeck (m2)	**24,77**	**at X (m)**	**4,290**						
>> ft2	*266,64*	*>> ft*	*14,08*						

2.2 Keel

Vol. keel(m3)	**0,14188**	**at X (m)**	**4,897**	**X (%Lwl)**	**50,23**	**Z (m)**	**-0,986**	
Mass keel(kg)	**1035,76**	*>> ft*	*16,07*			*>> ft*	*-3,24*	
>> lbs	*2283*							
Vol. Bulb(m3)	**0,10955**	**at X (m)**	**4,573**	**X (%Lwl)**	**46,90**	**Z (m)**	**-1,820**	
Mass bulb(kg)	**1243,36**	*>> ft*	*15,00*			*>> ft*	*-5,97*	
>> lbs	*2741*							
Draft oa (m)	**2,00**		**Sw (m2)**	**5,16**		**Sxz (m2)**	**1,81**	
>> ft	*6,56*		*>> ft2*	*55,53*		*>> ft2*	*19,46*	
LCR (m)	**5,114**	**LCR (%Lwl)**	**52,45**					
>> ft	*16,78*	method : keel profile extended to the waterline, LCR at 25% chord and 45% draft oa						

2.3 Rudder(s)

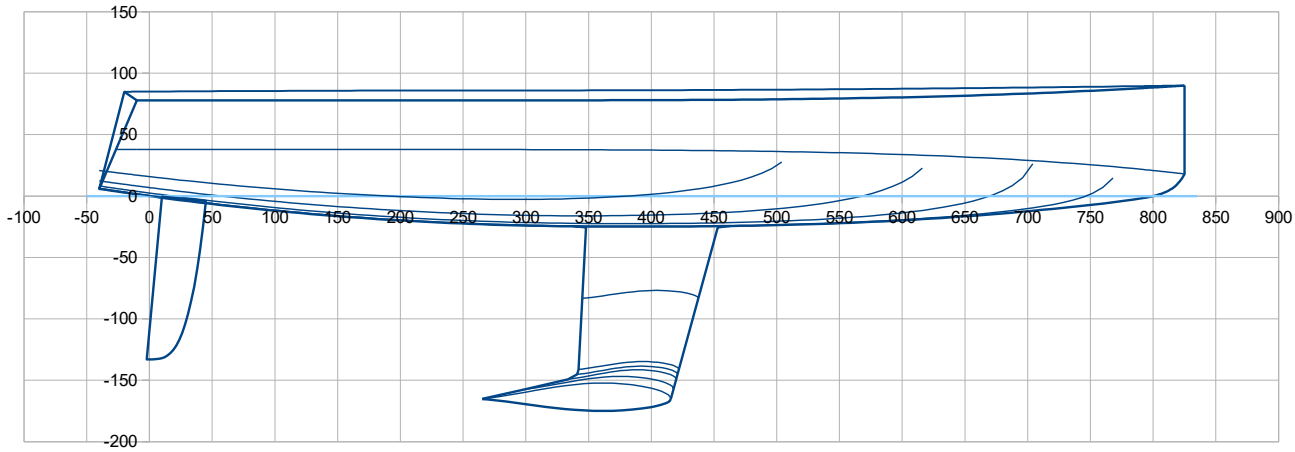
Number	**1**							
Volume (m3)	**0,01319**	**at X (m)**	**-0,081**	**X (%Lwl)**	**-0,84**	**Z (m)**	**-0,570**	
Sw (m2)	**0,84**	*>> ft*	*-0,27*			**Sxz (m2)**	**0,41**	per rudder
>> ft2	*9,08*					*>> ft2*	*4,37*	

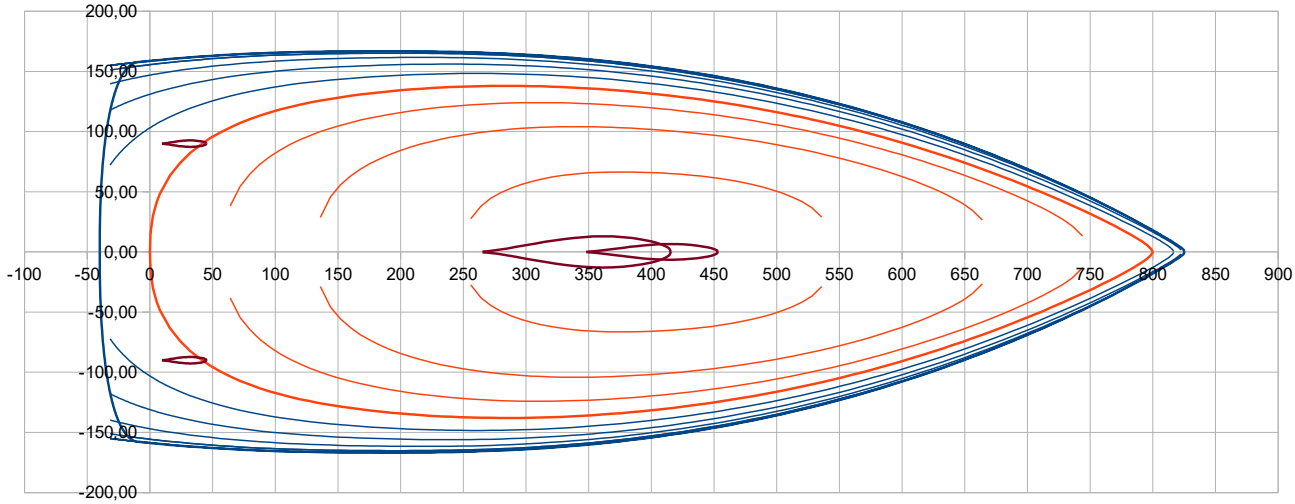
2.4 Hull + Keel + Rudder(s)

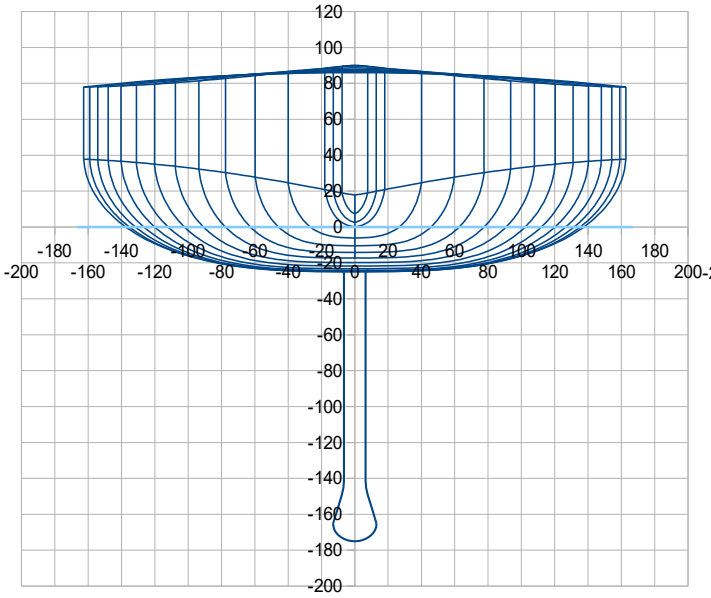
Displacement at H0 (m3)	**4,40427**	**at Xc (m)**	**4,552**	**Xc (%Lwl)**	**46,69**	**at Zc (m)**	**-0,223**	
(kg)	**4514**	*>> ft*	*14,93*			*>> ft*	*-0,73*	
>> lbs	*9952*							
Ballast (kg)	**2279**	**at Xg (m)**	**4,720**	**Xg (%Lwl)**	**48,41**	**at Zg (m)**	**-1,441**	
>> lbs	*5025*	*>> ft*	*15,49*			*>> ft*	*-4,73*	
>> % Ballast	50,5							
Sw (m2)	**24,18**	>Sw/D^(2/3)	9,00	Lwl/D^(1/3)	5,95			
>> ft2	*260,27*			*M/(Lwl/100)^3*	*138*	*tons, feet*		

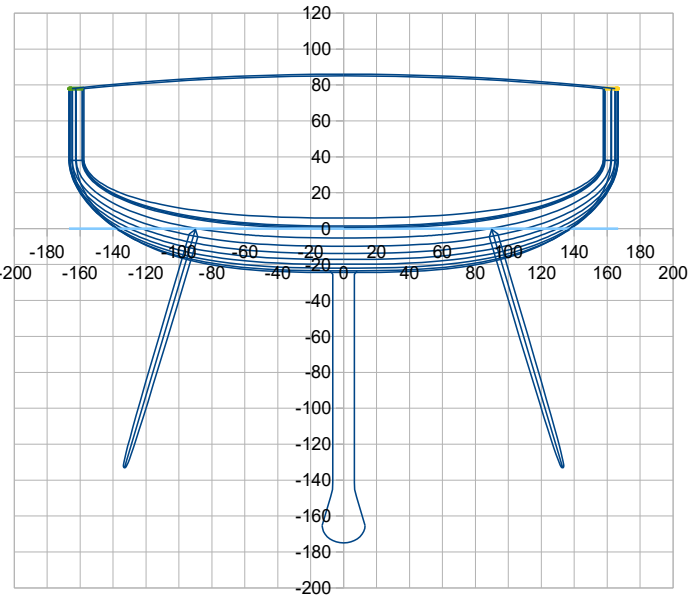
UE Reference boat with hard chine *with UE 2,3*

Loa 8,65 m ; Lwl 8,00 m ; B 3,34 m ; Draft 1,75 m ; Keel-bulb 1001 kg ; Displacement : 2682 kg









2. Data sum-up and results of hydrostatic and surfaces calculations

2.1 Hull

Loa (m)	**8,65**	**Lwl (m)**	**8,00**						
>> ft	*28,38*		*26,25*						
B (m)	**3,34**	**at X (% Lwl)**	**24,0**						
>> ft	*10,94*								
Bwl (m)	**2,76**	**at X (% Lwl)**	**36,0**	> Bwl/B	0,828				
>> ft	*9,06*					**Freeboards (m) >**	**Aft**	**Midship**	**Fore**
Tc (m)	**0,249**	**at X (%Lwl)**	**48,0**				**0,38**	**0,38**	**0,90**
>> ft	*0,82*					*>> ft*	*1,25*	*1,25*	*2,95*
Displacement at H0 (m3)	**2,45376**	**at Xc (m)**	**3,742**	**Xc (%Lwl)**	**46,78**		**Zc (m)**	**-0,092**	
>> lbs	*5545*	*w. seawater*	*1025*	*kg/m3*			*>> ft*	*-0,30*	
Disp at H(cm)	-3,00	1,98086	at Xc (m)	3,783	Xc (%Lwl)	47,29	Zc (m)	-0,081	
Disp at H(cm)	3,00	2,96033	at Xc (m)	3,700	Xc (%Lwl)	46,25	Zc (m)	-0,104	
Cp (%)	**59,09**								
Sf (m2)	**16,44**	**at Xf (m)**	**3,519**	**Xf (%Lwl)**	**43,98**	>>> Xc – Xf (%Lwl)		2,79	
>> ft2	*176,95*	*>> ft*	*11,54*						
Angle immersed sheer li (°)		**25,6**	at section C4 (40% Lwl)						
Sw (m2)	**16,72**	>Sm/D^(2/3)	9,19						
>> ft2	*179,97*								
Shull (m2)	**33,24**	**at X (m)**	**3,571**	**Z (m)**	**0,089**				
>> ft2	*357,74*	*>> ft*	*11,72*	*>> ft*	*0,29*				
Sdeck (m2)	**21,52**	**at X (m)**	**3,308**						
>> ft2	*231,65*	*>> ft*	*10,85*						

2.2 Keel

Vol. keel (m3)	**0,09005**	**at X (m)**	**3,993**	**X (%Lwl)**	**49,91**	**Z (m)**	**-0,794**
Mass keel(kg)	**657,36**	*>> ft*	*13,10*			*>> ft*	*-2,61*
>> lbs	*1449*						
Vol. Bulb(m3)	**0,04714**	**at X (m)**	**3,654**	**X (%Lwl)**	**45,67**	**Z (m)**	**-1,607**
Mass bulb(kg)	**344,11**	*>> ft*	*11,99*			*>> ft*	*-5,27*
>> lbs	*759*						
Draft oa (m)	**1,75**		**Sw (m2)**	**3,56**		**Sxz (m2)**	**1,35**
>> ft	*5,74*		*>> ft2*	*38,36*		*>> ft2*	*14,54*
LCR (m)	**4,15**	**LCR (%Lwl)**	**51,92**				
>> ft2	*44,71*	method : keel profile extended to the waterline, LCR at 25% chord and 45% draft oa					

2.3 Rudder(s)

Number	**2**							
Volume (m3)	**0,02586**	**at X (m)**	**0,235**	**X (%Lwl)**	**2,94**	**Z (m)**	**-0,602**	
Sw (m2)	**1,76**	*>> ft*	*0,77*			**Sxz (m2)**	**0,42**	per rudder
>> ft2	*18,98*					*>> ft2*	*4,56*	

2.4 Hull + Keel + Rudder(s)

Displacement at H0 (m3)	**2,61681**	**at Xc (m)**	**3,714**	**Xc (%Lwl)**	**46,43**	**Zc (m)**	**-0,149**
(kg)	**2682**	*>> ft*	*12,19*			*>> ft*	*-0,49*
>> lbs	*5913*						
Ballast (kg)	**1001**	**at Xg (m)**	**3,876**	**Xg (%Lwl)**	**48,45**	**Zg (m)**	**-1,073**
>> lbs	*2208*	*>> ft*	*12,72*			*>> ft*	*-3,52*
>> % Ballast	37,3						
Sw (m2)	**22,05**	>Sw/D^(2/3)	11,61	Lwl/D^(1/3)	5,81		
>> ft2	*237,31*			*M/(Lwl/100)^3*	*148*	*tons, feet*	

2.5 Data from the mass spreadsheet

Light boat:	**M (kg)**	**2682**	**at Xg (m)**	**3,725**		**at Zg (m)**	**0,250**

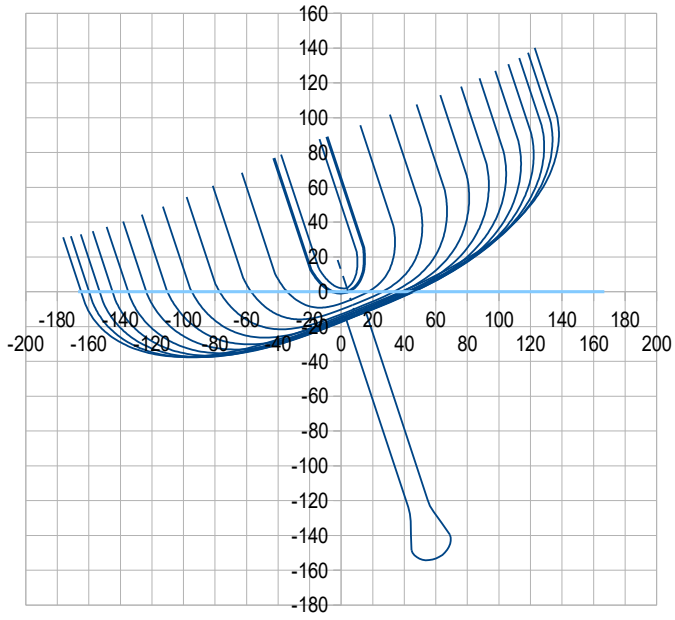
6. Hull-Keel-Rudder with heel

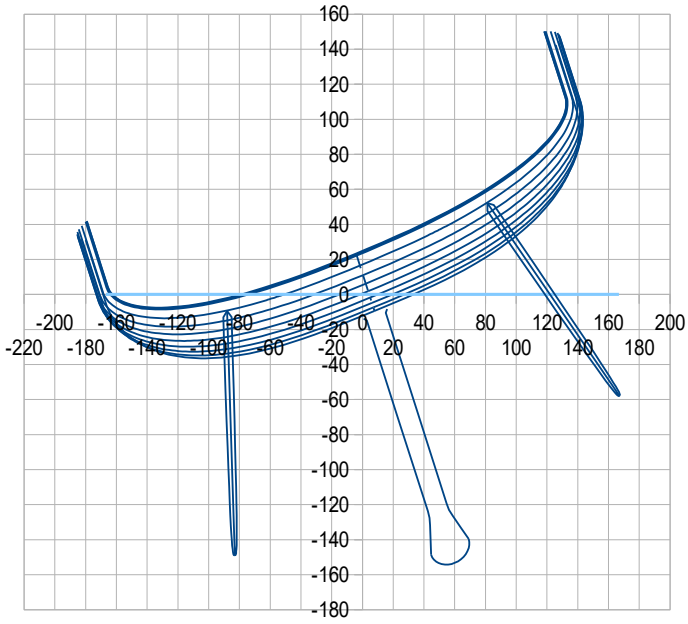
Data to enter	
Heel (°)	20,0
Height (cm)	12,7967
Trim (°)	-1,728

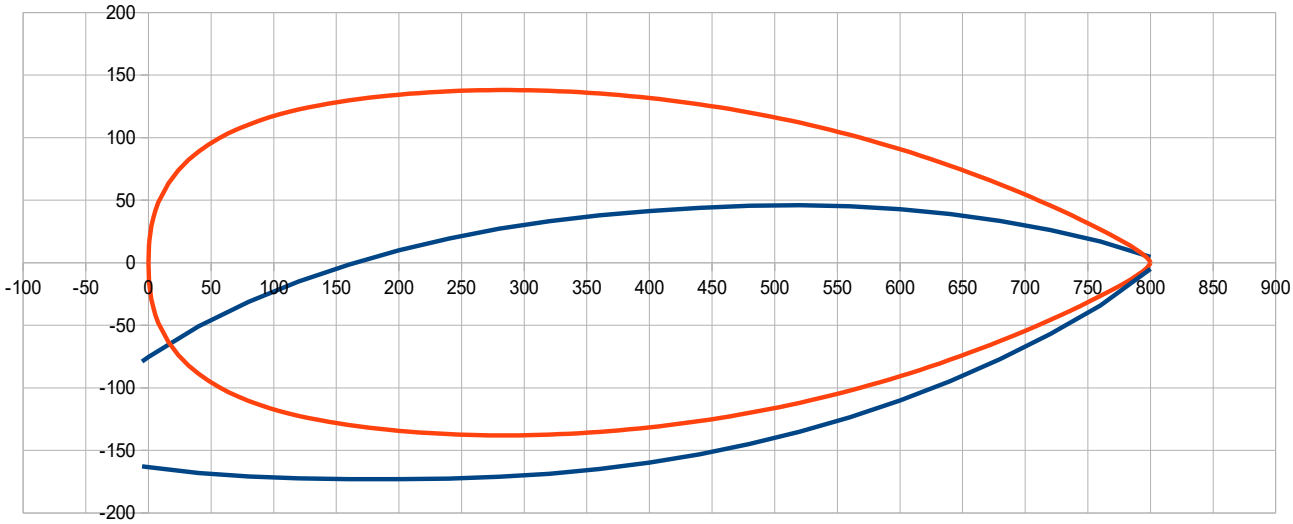
Results for iteration on height and trim	
Disp. (m3)	2,61612
Xc heel (m)	3,725
Other results	
Yc heel (m)	-0,660
Zc heel (m)	-0,145
Sw heel (m2)	18,54

Data to compare with :	
Mass (kg)	2681,52
/ Disp. (m3)	2,61612
/ Xg (m)	3,725
Xc Heel 0°	3,714
Yc Heel 0°	0,000
Zc Heel 0°	-0,149
Sw Heel 0°	22,05

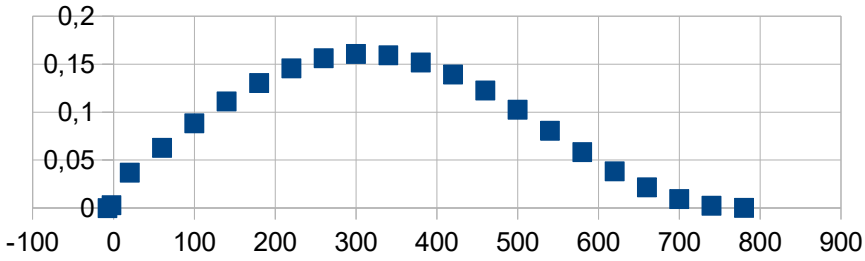
Other results for RM and obliquity	
Hull Mom(m4)	1,726
Mom(kN.m)	17,36
Yg heel (m)	-0,085
>> GZ (m)	0,574
RM (kN.m)	15,11
Obliquity (°)	7,62







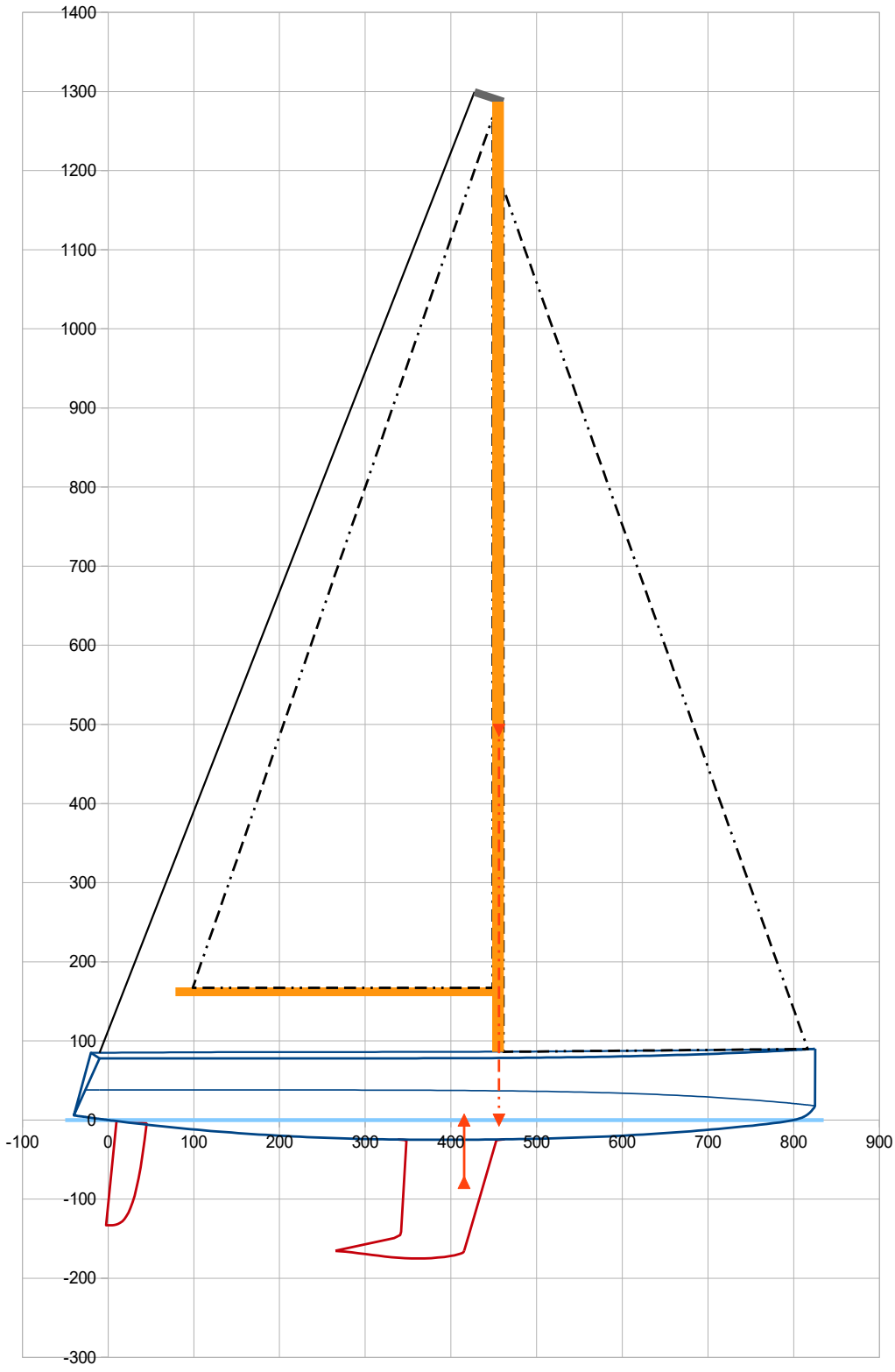
Hull Righting Moment (m4) per volumes inter sections



Sailplan – early stage definition

Data to enter		>> in feet
Xmast (m)	**4,55**	*14,93*
Zboom(m)	**1,62**	*5,31*
I (m)	**10,90**	*35,76*
J (m)	**3,55**	*11,65*
P (m)	**11,00**	*36,09*
E (m)	**3,50**	*11,48*

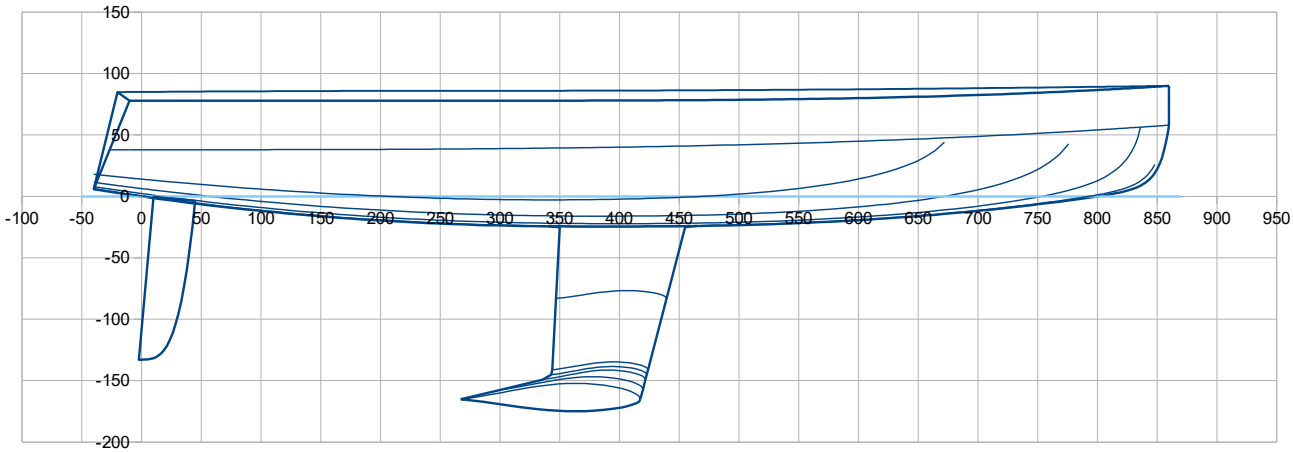
Results for the Sailplan (i.e. Fore + Main triangles)				
Geometrical center				
Xv (m)	4,561	Zv (m)	4,925	
Surface triangles St (m2)		**38,60**	*415,46*	*sqft*
>> St / Sw		1,75		
>> St / D^(2/3)		20,33		
>> Skeel / St (%)		3,50		
>> Srudder / St (%)		1,10		
Lead (Xv – LCR) (% Lwl)		**5,1**		

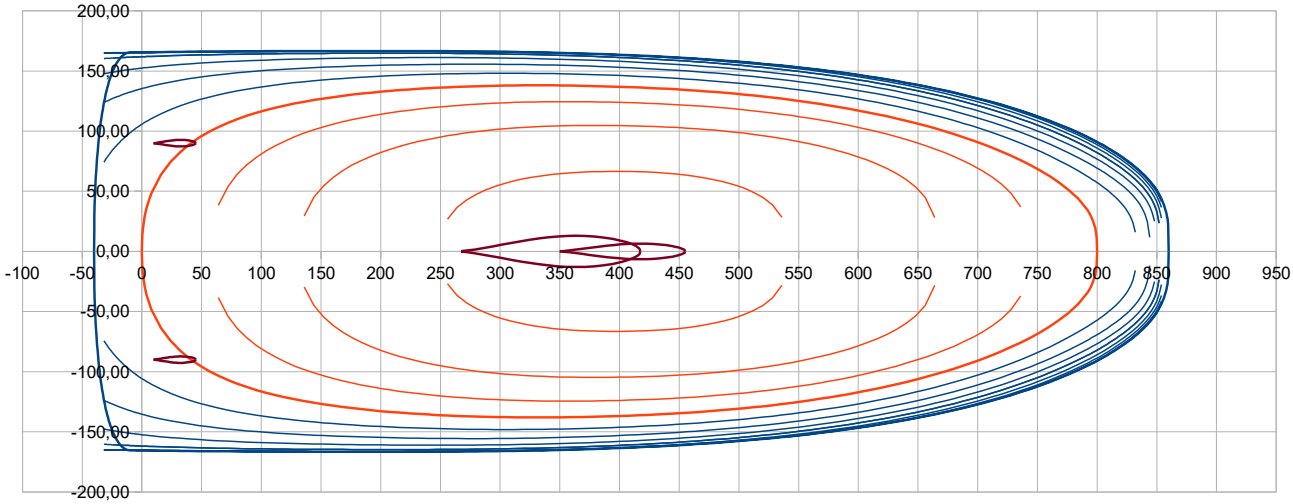


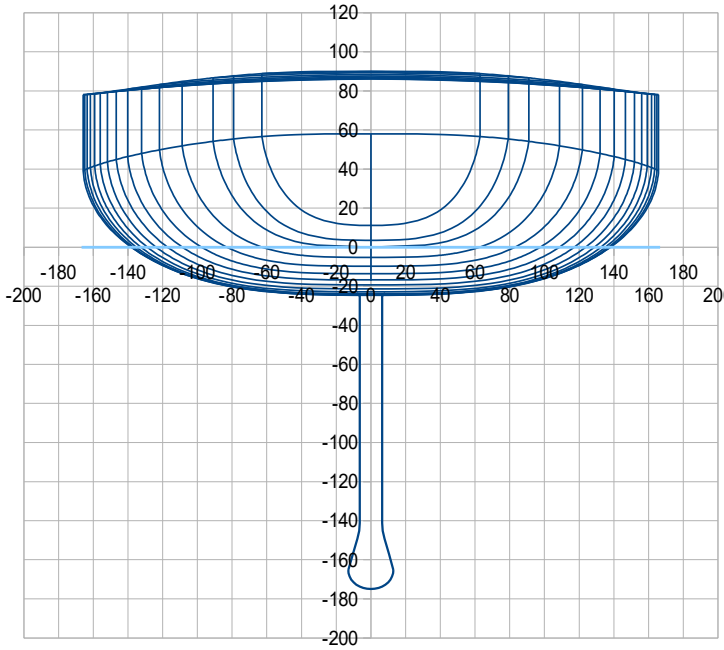
Mass and Xg, Zg position – early stage estimation	**Input data**		**Results**				
Data from Gene-Hull sheet are in blue	**L or S or V**	**mass unit**	**Mass**	**Xg**	M Xg	**Zg**	M Zg
Data to enter are in bold black (inc. default value to initiate)	m or m2 or m3	**or % Disp.**	**(kg)**	**(m)**		**(m)**	
Hull (skin, structure, keel interface)	33,24	**18,00**	598,24	3,57	2136,46	0,09	53,35
, with S, Xs and Zs from Gene-Hull sheet		(kg/m2)					
Deck – roof – cockpit (skin and structure)	21,52	**14,00**	301,29	3,31	996,74	0,86	259,11
, with S, Xs and Zs from Gene-Hull sheet		(kg/m2)					
Rig, sails and deck fittings		**15,00**	402,33	**3,95**	1589,22	**3,50**	1408,17
		(% Disp.)					
Cabin accomodation and motor		**13,00**	348,69	**3,95**	1377,32	**0,12**	41,84
		(% Disp.)					
Keel			1001,47	3,88	3882,06	-1,07	-1074,90
Rudder		**1,10**	29,50	0,24	6,94	-0,60	-17,75
		(% Disp.)					
Results : Light weight boat >>>			**2681,52**	**3,73**	9988,75	**0,25**	669,82

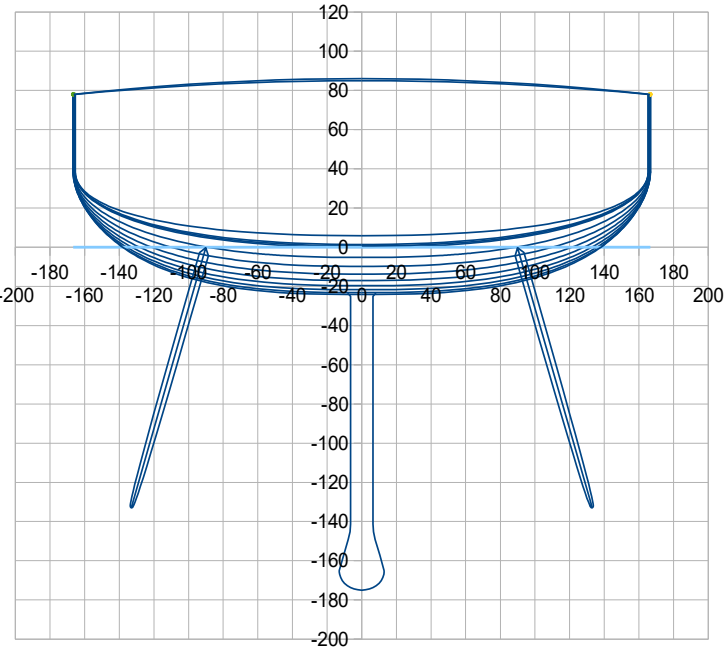
UE Reference boat with hard chine and scow bow *with UE 2,3*

Loa 9,00 m ; Lwl 8,00 m ; B 3,33 m ; Draft 1,75 m ; Keel-bulb 1003 kg ; Displacement : 2848 kg









2. Data sum-up and results of hydrostatic and surfaces calculations

2.1 Hull

Loa (m)	**9,00**	**Lwl (m)**	**8,00**						
>> ft	*29,53*		*26,25*						
B (m)	**3,33**	**at X (% Lwl)**	**24,0**						
>> ft	*10,94*								
Bwl (m)	**2,76**	**at X (% Lwl)**	**41,0**	> Bwl/B	0,829				
>> ft	*9,06*					**Freeboards (m) >**	**Aft**	**Midship**	**Fore**
Tc (m)	**0,246**	**at X (%Lwl)**	**48,0**				**0,38**	**0,38**	**0,90**
>> ft	*0,81*					*>> ft*	*1,25*	*1,25*	*2,95*
Displacement at H0 (m3)	**2,61503**	**at Xc (m)**	**3,924**	**Xc (%Lwl)**	**49,05**		**Zc (m)**	**-0,090**	
>> lbs	*5909*	*w. seawater*	*1025*	*kg/m3*			*>> ft*	*-0,29*	
Disp at H(cm)	-3,00	2,09032	at Xc (m)	3,942	Xc (%Lwl)	49,27	Zc (m)	-0,079	
Disp at H(cm)	3,00	3,18349	at Xc (m)	3,906	Xc (%Lwl)	48,83	Zc (m)	-0,101	
Cp (%)	**63,15**								
Sf (m2)	**18,36**	**at Xf (m)**	**3,831**	**Xf (%Lwl)**	**47,89**	>>> Xc – Xf (%Lwl)		1,16	
>> ft2	*197,63*	*>> ft*	*12,57*						
Angle immersed sheer li (°)	**25,2**	at section C4 (40% Lwl)							
Sw (m2)	**18,46**	>Sm/D^(2/3)	9,73						
>> ft2	*198,72*								
Shull (m2)	**36,65**	**at X (m)**	**3,863**	**Z (m)**	**0,084**				
>> ft2	*394,48*	*>> ft*	*12,68*	*>> ft*	*0,28*				
Sdeck (m2)	**25,52**	**at X (m)**	**3,820**						
>> ft2	*274,66*	*>> ft*	*12,53*						

2.2 Keel

Vol. keel (m3)	**0,09029**	**at X (m)**	**4,013**	**X (%Lwl)**	**50,16**	**Z (m)**	**-0,792**
Mass keel(kg)	**659,09**	*>> ft*	*13,16*			*>> ft*	*-2,60*
>> lbs	*1453*						
Vol. Bulb(m3)	**0,04714**	**at X (m)**	**3,673**	**X (%Lwl)**	**45,91**	**Z (m)**	**-1,607**
Mass bulb(kg)	**344,11**	*>> ft*	*12,05*			*>> ft*	*-5,27*
>> lbs	*759*						
Draft oa (m)	**1,75**		**Sw (m2)**	**3,57**		**Sxz (m2)**	**1,35**
>> ft	*5,74*		*>> ft2*	*38,42*		*>> ft2*	*14,58*
LCR (m)	**4,17**	**LCR (%Lwl)**	**52,16**				
>> ft2	*44,91*	method : keel profile extended to the waterline, LCR at 25% chord and 45% draft oa					

2.3 Rudder(s)

Number	**2**							
Volume (m3)	**0,02586**	**at X (m)**	**0,235**	**X (%Lwl)**	**2,94**	**Z (m)**	**-0,600**	
Sw (m2)	**1,76**	*>> ft*	*0,77*			**Sxz (m2)**	**0,42**	per rudder
>> ft2	*18,98*					*>> ft2*	*4,56*	

2.4 Hull + Keel + Rudder(s)

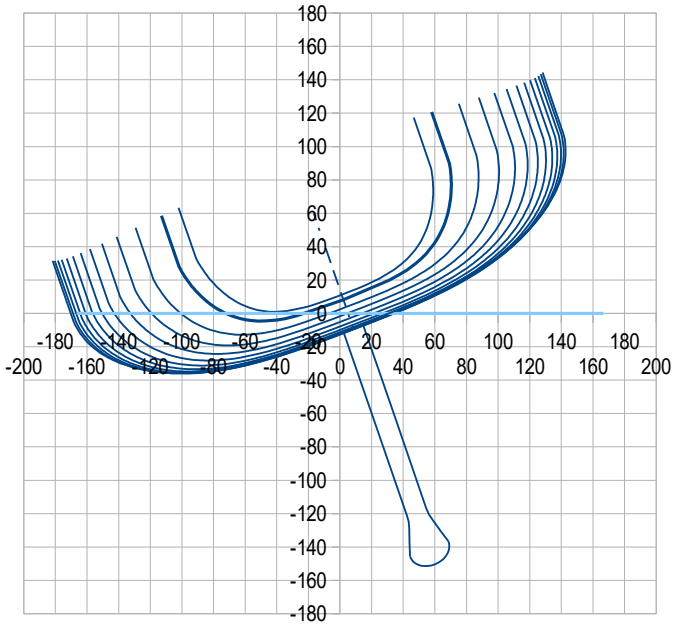
Displacement at H0 (m3)	**2,77832**	**at Xc (m)**	**3,888**	**Xc (%Lwl)**	**48,61**	**Zc (m)**	**-0,143**
(kg)	**2848**	*>> ft*	*12,76*			*>> ft*	*-0,47*
>> lbs	*6278*						
Ballast (kg)	**1003**	**at Xg (m)**	**3,896**	**Xg (%Lwl)**	**48,70**	**Zg (m)**	**-1,072**
>> lbs	*2212*	*>> ft*	*12,78*			*>> ft*	*-3,52*
>> % Ballast	35,2						
Sw (m2)	**23,79**	>Sw/D^(2/3)	12,04	Lwl/D^(1/3)	5,69		
>> ft2	*256,12*			*M/(Lwl/100)^3*	*158*	*tons, feet*	

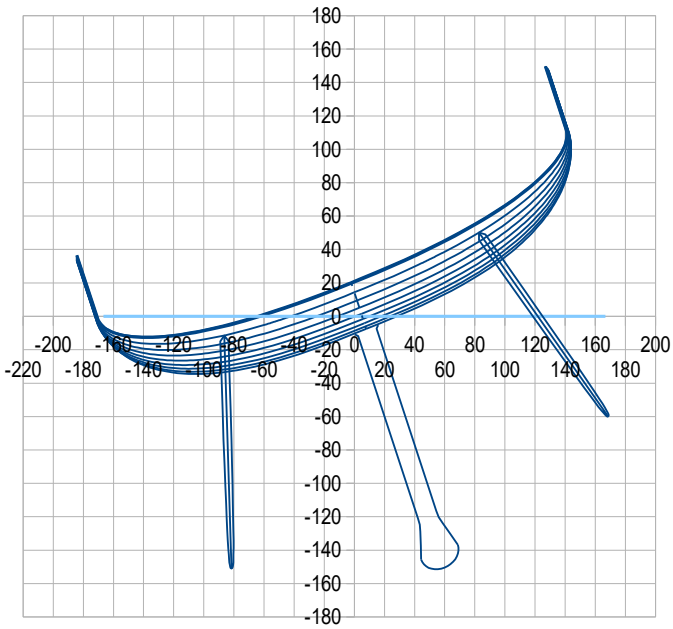
2.5 Data from the mass spreadsheet

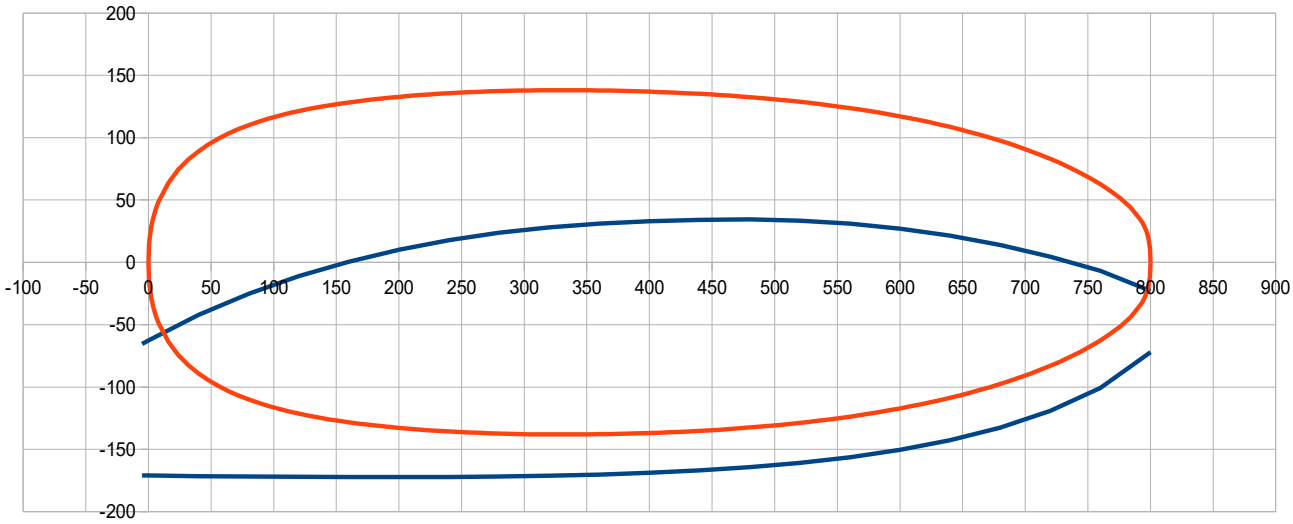
Light boat:	**M (kg)**	**2849**	**at Xg (m)**	**3,861**		**at Zg (m)**	**0,284**

6. Hull-Keel-Rudder with heel

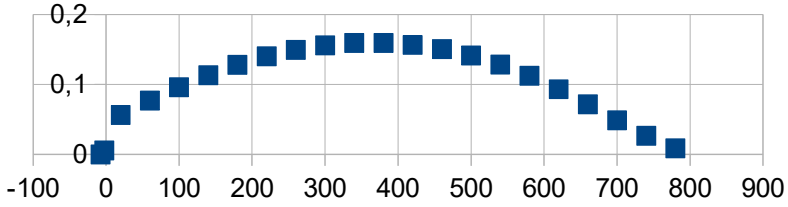
Data to enter		Results for iteration on height and trim		Data to compare with :		Other results for RM and obliquity	
Heel (°)	20,0	Disp. (m3)	2,77933	Mass (kg)	2848,81	Hull Mom(m4)	2,126
Height (cm)	15,0637	Xc heel (m)	3,861	/ Disp. (m3)	2,77933	Mom(kN.m)	21,37
Trim (°)	-0,885	**Other results**		/ Xg (m)	3,861	Yg heel (m)	-0,097
		Yc heel (m)	-0,765	Xc Heel 0°	3,888	>> GZ (m)	0,668
		Zc heel (m)	-0,142	Yc Heel 0°	0,000	RM (kN.m)	18,66
		Sw heel (m2)	19,70	Zc Heel 0°	-0,143	Obliquity (°)	3,68
				Sw Heel 0°	23,79		







Hull Righting Moment (m4) per volumes inter sections



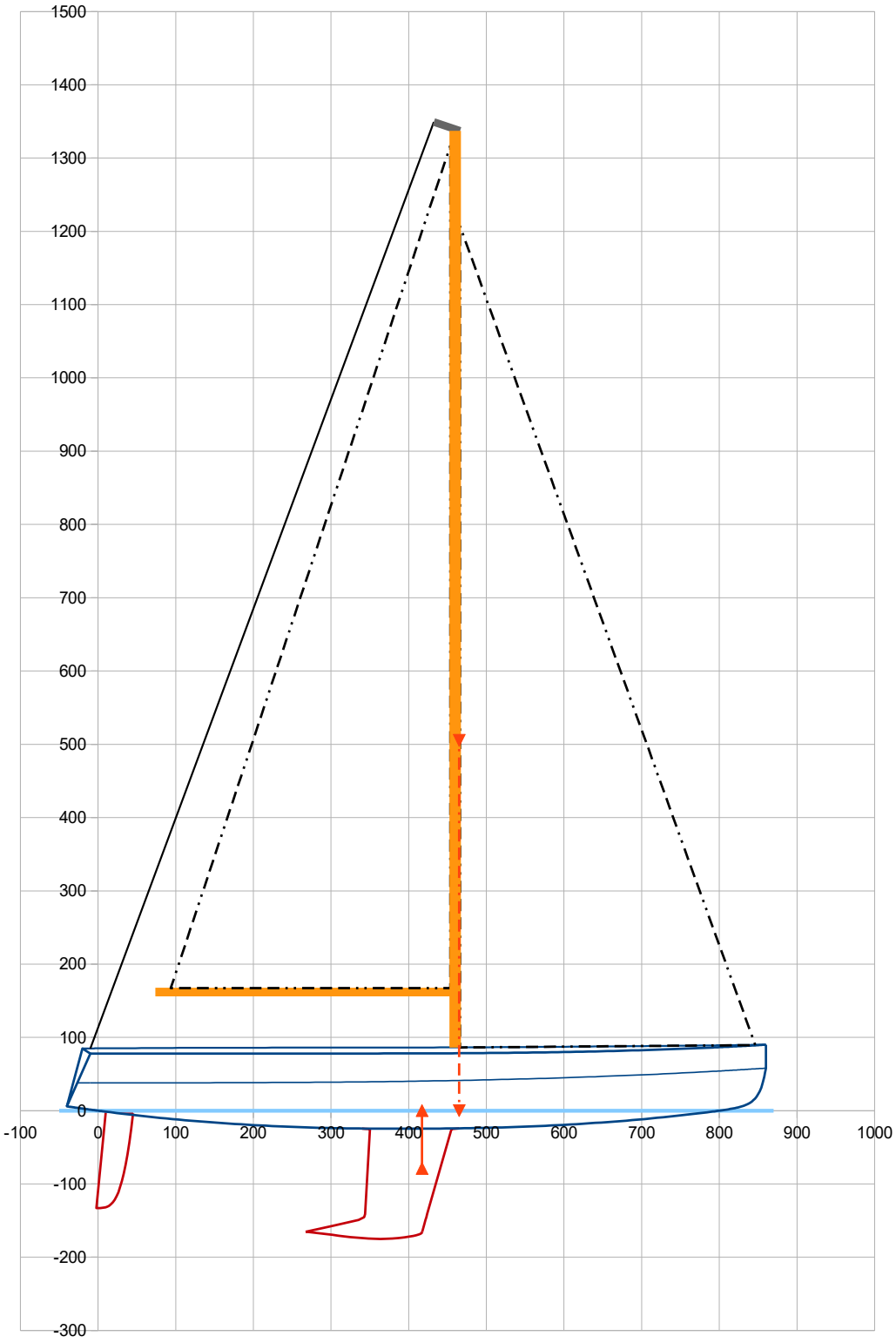
Sailplan – early stage definition

Data to enter		*>> in feet*
Xmast (m)	**4,60**	*15,09*
Zboom(m)	**1,62**	*5,31*
I (m)	**11,20**	*36,75*
J (m)	**3,80**	*12,47*
P (m)	**11,50**	*37,73*
E (m)	**3,60**	*11,81*

Results for the Sailplan (i.e. Fore + Main triangles)

Geometrical center

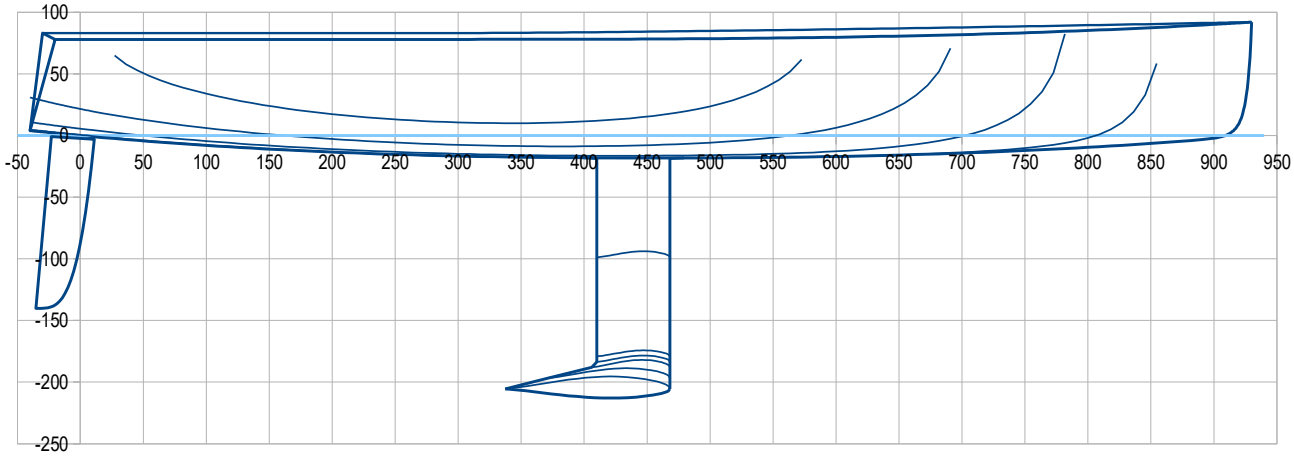
Xv (m)	4,651	Zv (m)	5,053	
Surface triangles St (m2)		**41,98**	*451,87*	*sqft*
>> St / Sw		1,76		
>> St / D^(2/3)		21,24		
>> Skeel / St (%)		3,23		
>> Srudder / St (%)		1,01		
Lead (Xv – LCR) (% Lwl)		**6,0**		

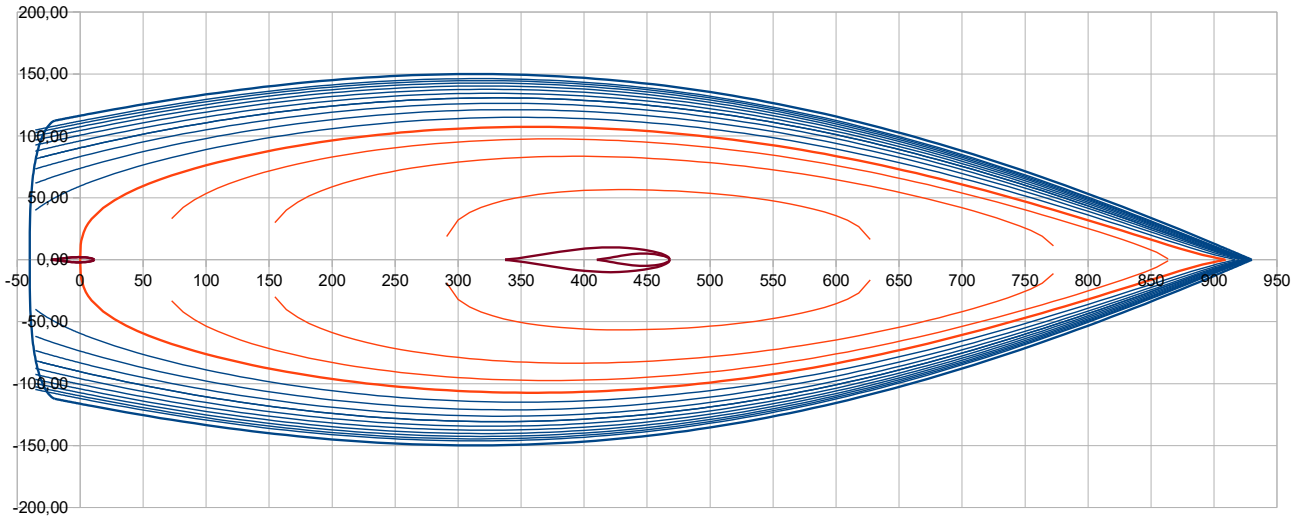


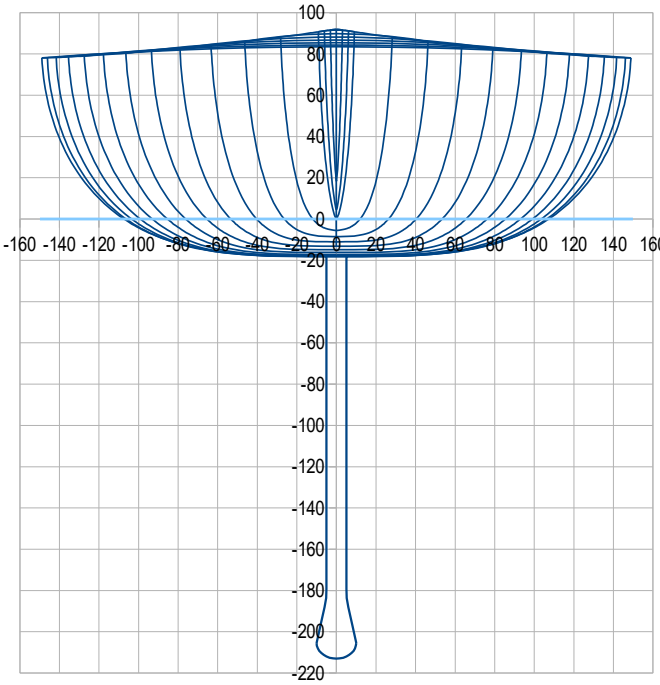
Mass and Xg, Zg position – early stage estimation	**Input data**		**Results**				
Data from Gene-Hull sheet are in blue	**L or S or V**	**mass unit**	**Mass**	**Xg**	M Xg	**Zg**	M Zg
Data to enter are in bold black (inc. default value to initiate)	m or m2 or m3	**or % Disp.**	**(kg)**	**(m)**		**(m)**	
Hull (skin, structure, keel interface)	36,65	**18,00**	659,67	3,86	2548,54	0,08	55,36
, with S, Xs and Zs from Gene-Hull sheet		(kg/m2)					
Deck – roof – cockpit (skin and structure)	25,52	**14,00**	357,24	3,82	1364,67	0,86	307,23
, with S, Xs and Zs from Gene-Hull sheet		(kg/m2)					
Rig, sails and deck fittings		**15,00**	427,17	**4,00**	1708,67	**3,50**	1495,08
		(% Disp.)					
Cabin accomodation and motor		**13,00**	370,21	**3,95**	1462,33	**0,12**	44,43
		(% Disp.)					
Keel			1003,20	3,90	3908,52	-1,07	-1075,20
Rudder		**1,10**	31,33	0,24	7,37	-0,60	-18,80
		(% Disp.)					
Results : Light weight boat >>>			**2848,81**	**3,86**	11000,10	**0,28**	808,09

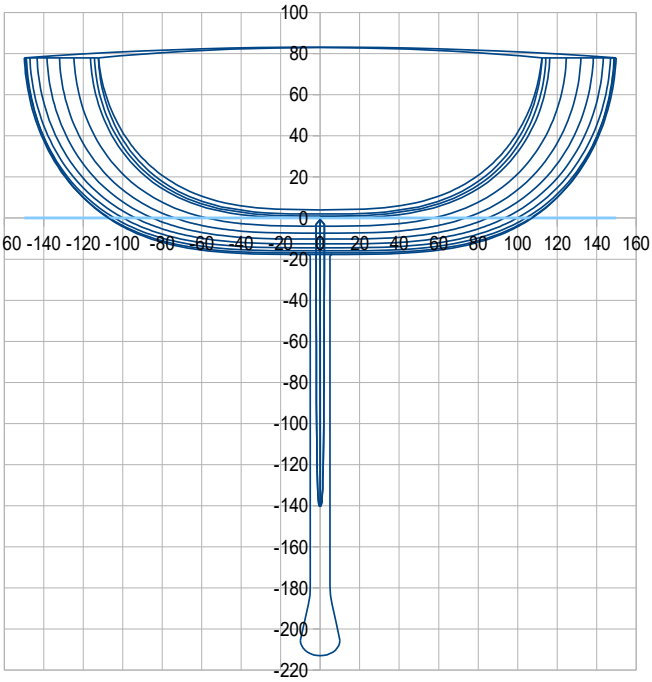
M32, inspired by Melges 32 / Reichel Pugh *with UE 2,3*

Loa 9,70 m ; Lwl 9,09 m ; B 3,00 m ; Draft 2,13 m ; Keel-bulb 774 kg ; Displacement : 1717 kg









2. Data sum-up and results of hydrostatic and surfaces calculations

2.1 Hull

Loa (m)	**9,70**	**Lwl (m)**	**9,09**					
>> ft	*31,82*		*29,82*					
B (m)	**3,00**	**at X (% Lwl)**	**34,0**					
>> ft	*9,83*							
Bwl (m)	**2,15**	**at X (% Lwl)**	**40,0**	> Bwl/B	0,716			
>> ft	*7,04*				**Freeboards (m) >**	**Aft**	**Midship**	**Fore**
Tc (m)	**0,182**	**at X (%Lwl)**	**50,0**			**0,78**	**0,78**	**0,92**
>> ft	*0,60*				*>> ft*	*2,56*	*2,56*	*3,02*
Displacement at H0 (m3)	**1,57520**	**at Xc (m)**	**4,241**	**Xc (%Lwl)**	**46,66**	**Zc (m)**	**-0,070**	
>> lbs	*3560*	*w. seawater*	*1025*	*kg/m3*		*>> ft*	*-0,23*	
Disp at H(cm)	-2,38	1,26214	at Xc (m)	4,292	Xc (%Lwl)	47,22	Zc (m)	-0,054
Disp at H(cm)	2,38	1,90924	at Xc (m)	4,192	Xc (%Lwl)	46,11	Zc (m)	-0,085
Cp (%)	**57,01**							
Sf (m2)	**13,68**	**at Xf (m)**	**3,981**	**Xf (%Lwl)**	**43,80**	>>> Xc – Xf (%Lwl)	2,86	
>> ft2	*147,26*	*>> ft*	*13,06*					
Angle immersed sheer li (°)	**27,7**	at section C4 (40% Lwl)						
Sw (m2)	**13,98**	>Sm/D^(2/3)	10,32					
>> ft2	*150,46*							
Shull (m2)	**32,32**	**at X (m)**	**4,122**	**Z (m)**	**0,148**			
>> ft2	*347,92*	*>> ft*	*13,52*	*>> ft*	*0,49*			
Sdeck (m2)	**21,24**	**at X (m)**	**3,757**					
>> ft2	*228,67*	*>> ft*	*12,32*					

2.2 Keel

Vol. keel (m3)	**0,06024**	**at X (m)**	**4,436**	**X (%Lwl)**	**48,80**	**Z (m)**	**-0,989**	
Mass keel(kg)	**439,78**	*>> ft*	*14,55*			*>> ft*	*-3,25*	
>> lbs	*970*							
Vol. Bulb(m3)	**0,02948**	**at X (m)**	**4,246**	**X (%Lwl)**	**46,71**	**Z (m)**	**-1,998**	
Mass bulb(kg)	**334,65**	*>> ft*	*13,93*			*>> ft*	*-6,56*	
>> lbs	*738*							
Draft oa (m)	**2,13**		**Sw (m2)**	**2,90**		**Sxz (m2)**	**1,17**	
>> ft	*6,99*		*>> ft2*	*31,25*		*>> ft2*	*12,54*	
LCR (m)	**4,54**	**LCR (%Lwl)**	**49,89**					
>> ft2	*48,81*	method : keel profile extended to the waterline, LCR at 25% chord and 45% draft oa						

2.3 Rudder(s)

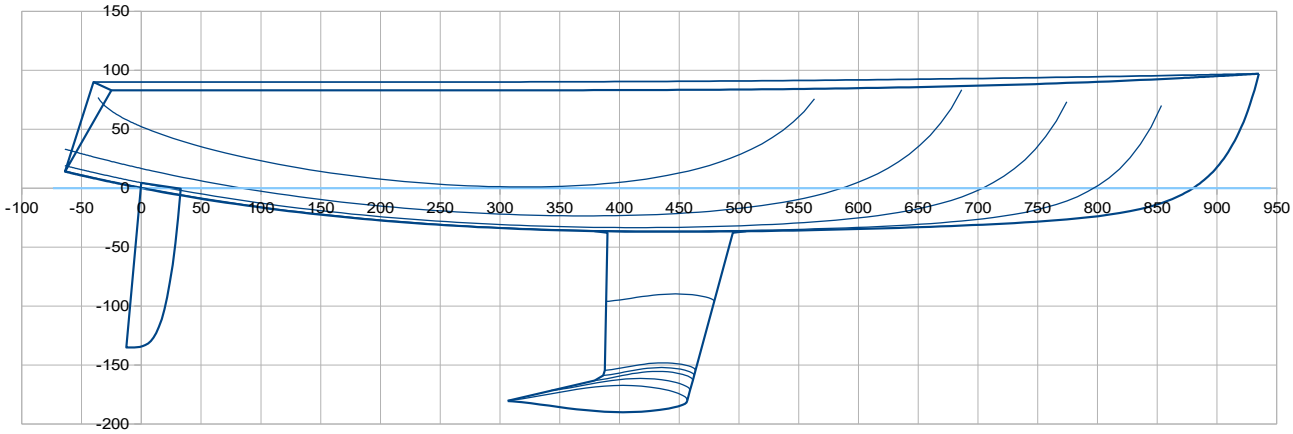
Number	**1**							
Volume (m3)	**0,00987**	**at X (m)**	**-0,100**	**X (%Lwl)**	**-1,10**	**Z (m)**	**-0,600**	
Sw (m2)	**0,86**	*>> ft*	*-0,33*			**Sxz (m2)**	**0,41**	per rudder
>> ft2	*9,27*					*>> ft2*	*4,46*	

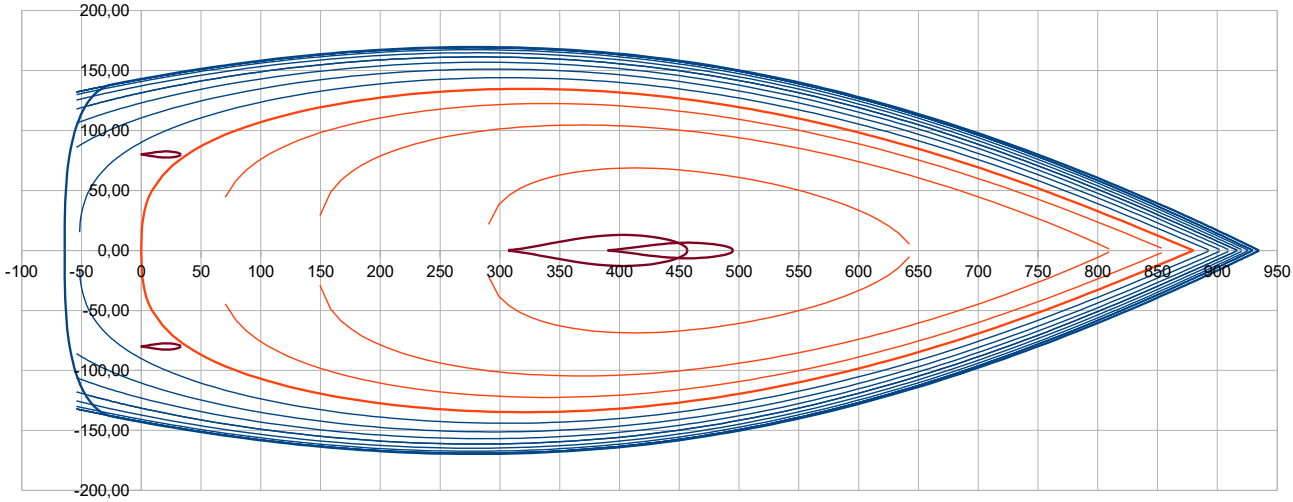
2.4 Hull + Keel + Rudder(s)

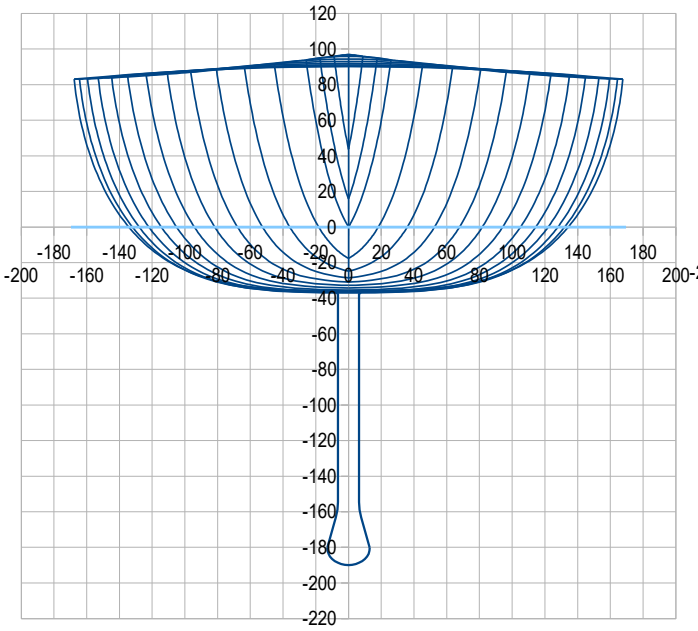
Displacement at H0 (m3)	**1,67480**	**at Xc (m)**	**4,223**	**Xc (%Lwl)**	**46,46**	**Zc (m)**	**-0,140**
(kg)	**1717**	*>> ft*	*13,85*			*>> ft*	*-0,46*
>> lbs	*3785*						
Ballast (kg)	**774**	**at Xg (m)**	**4,354**	**Xg (%Lwl)**	**47,90**	**Zg (m)**	**-1,425**
>> lbs	*1707*	*>> ft*	*14,29*			*>> ft*	*-4,68*
>> % Ballast	45,1						
Sw (m2)	**17,74**	>Sw/D^(2/3)	12,58	Lwl/D^(1/3)	7,65		
>> ft2	*190,98*			*M/(Lwl/100)^3*	*65*	*tons, feet*	

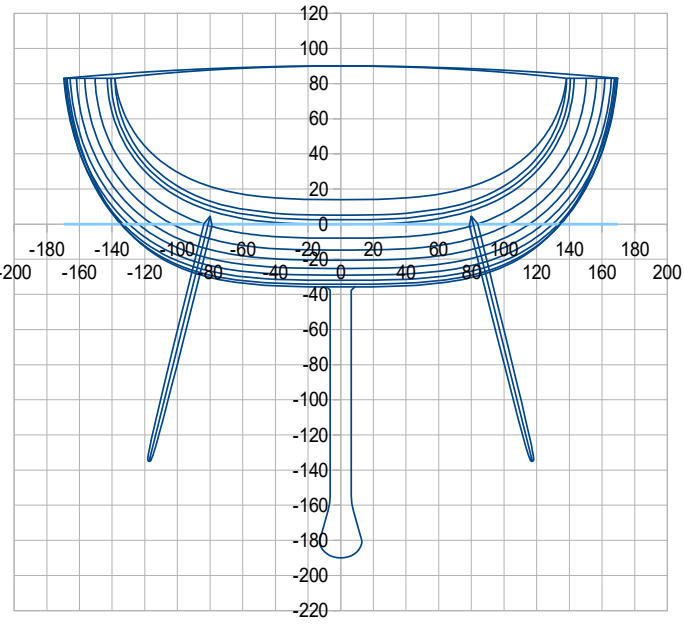
T10, inspired by Tofinou 10 / Joubert-Nivelt *with UE 2,3*

Loa 9,99 m ; Lwl 9,80 m ; B 3,39 m ; Draft 1,90 m ; Keel-bulb 1201 kg ; Displacement : 4202 kg









2. Data sum-up and results of hydrostatic and surfaces calculations

2.1 Hull

Loa (m)	**9,99**	**Lwl (m)**	**8,80**					
>> ft	*32,78*		*28,87*					
B (m)	**3,39**	**at X (% Lwl)**	**32,0**					
>> ft	*11,13*							
Bwl (m)	**2,70**	**at X (% Lwl)**	**36,0**	> Bwl/B	0,795			
>> ft	*8,84*				**Freeboards (m) >**	**Aft**	**Midship**	**Fore**
Tc (m)	**0,37**	**at X (%Lwl)**	**50,0**			**0,83**	**0,83**	**0,97**
>> ft	*1,21*				*>> ft*	*2,72*	*2,72*	*3,18*
Displacement at H0 (m3)	**3,93677**	**at Xc (m)**	**4,109**	**Xc (%Lwl)**	**46,69**	**Zc (m)**	**-0,141**	
>> lbs	*8896*	*w. seawater*	*1025*	*kg/m3*		*>> ft*	*-0,46*	
Disp at H(cm)	-3,00	3,44078	at Xc (m)	4,147	Xc (%Lwl)	47,12	Zc (m)	-0,129
Disp at H(cm)	3,00	4,45661	at Xc (m)	4,071	Xc (%Lwl)	46,26	Zc (m)	-0,152
Cp (%)	**58,43**							
Sf (m2)	**17,03**	**at Xf (m)**	**3,798**	**Xf (%Lwl)**	**43,16**	>>> Xc – Xf (%Lwl)	3,53	
>> ft2	*183,33*	*>> ft*	*12,46*					
Angle immersed sheer li (°)	**26,3**	at section C4 (40% Lwl)						
Sw (m2)	**18,16**	>Sm/D^(2/3)	7,28					
>> ft2	*195,43*							
Shull (m2)	**37,33**	**at X (m)**	**3,964**	**Z (m)**	**0,080**			
>> ft2	*401,76*	*>> ft*	*13,01*	*>> ft*	*0,26*			
Sdeck (m2)	**24,37**	**at X (m)**	**3,680**					
>> ft2	*262,36*	*>> ft*	*12,07*					

2.2 Keel

Vol. keel (m3)	**0,08886**	**at X (m)**	**4,421**	**X (%Lwl)**	**50,24**	**Z (m)**	**-0,915**	
Mass keel(kg)	**648,71**	*>> ft*	*14,50*			*>> ft*	*-3,00*	
>> lbs	*1430*							
Vol. Bulb(m3)	**0,04863**	**at X (m)**	**4,072**	**X (%Lwl)**	**46,28**	**Z (m)**	**-1,753**	
Mass bulb(kg)	**551,96**	*>> ft*	*13,36*			*>> ft*	*-5,75*	
>> lbs	*1217*							
Draft oa (m)	**1,90**		**Sw (m2)**	**3,56**		**Sxz (m2)**	**1,35**	
>> ft	*6,23*		*>> ft2*	*38,31*		*>> ft2*	*14,53*	
LCR (m)	**4,59**	**LCR (%Lwl)**	**52,15**					
>> ft2	*49,40*	method : keel profile extended to the waterline, LCR at 25% chord and 45% draft oa						

2.3 Rudder(s)

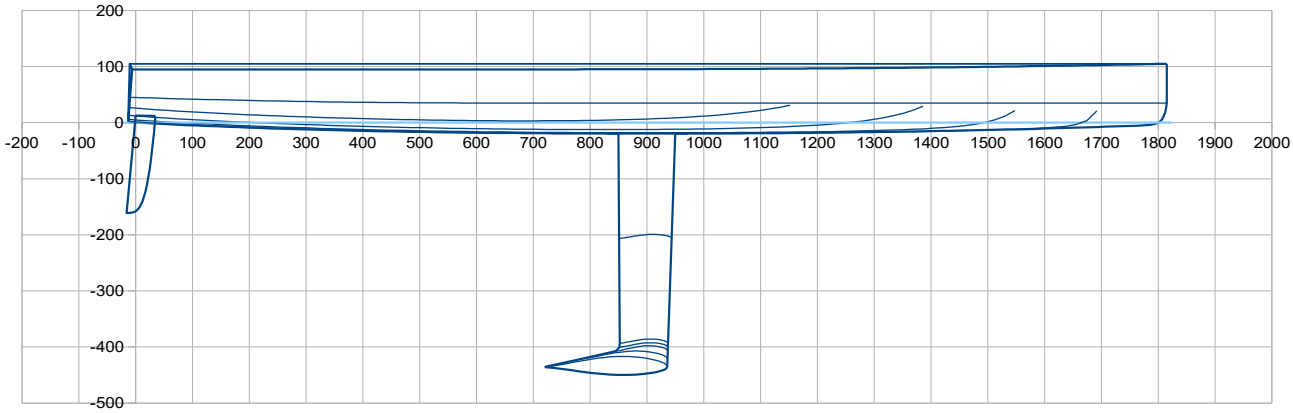
Number	**2**							
Volume (m3)	**0,02572**	**at X (m)**	**0,125**	**X (%Lwl)**	**1,42**	**Z (m)**	**-0,608**	
Sw (m2)	**1,80**	*>> ft*	*0,41*			**Sxz (m2)**	**0,43**	per rudder
>> ft2	*19,33*					*>> ft2*	*4,65*	

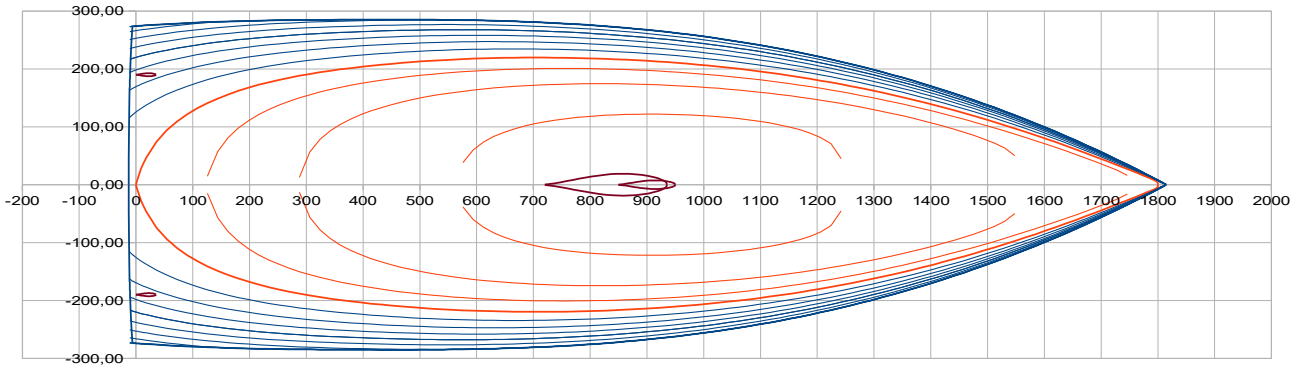
2.4 Hull + Keel + Rudder(s)

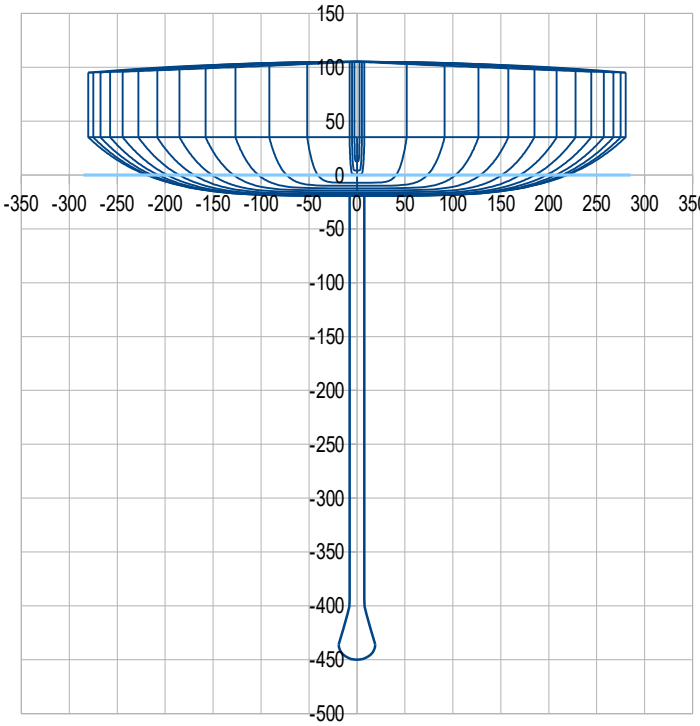
Displacement at H0 (m3)	**4,09999**	**at Xc (m)**	**4,090**	**Xc (%Lwl)**	**46,48**	**Zc (m)**	**-0,179**	
(kg)	**4202**	*>> ft*	*13,42*			*>> ft*	*-0,59*	
>> lbs	*9265*							
Ballast (kg)	**1201**	**at Xg (m)**	**4,261**	**Xg (%Lwl)**	**48,42**	**Zg (m)**	**-1,300**	
>> lbs	*2647*	*>> ft*	*13,98*			*>> ft*	*-4,26*	
>> % Ballast	28,6							
Sw (m2)	**23,51**	>Sw/D^(2/3)	9,18	Lwl/D^(1/3)	5,50			
>> ft2	*253,07*			*M/(Lwl/100)^3*	*175*	*tons, feet*		

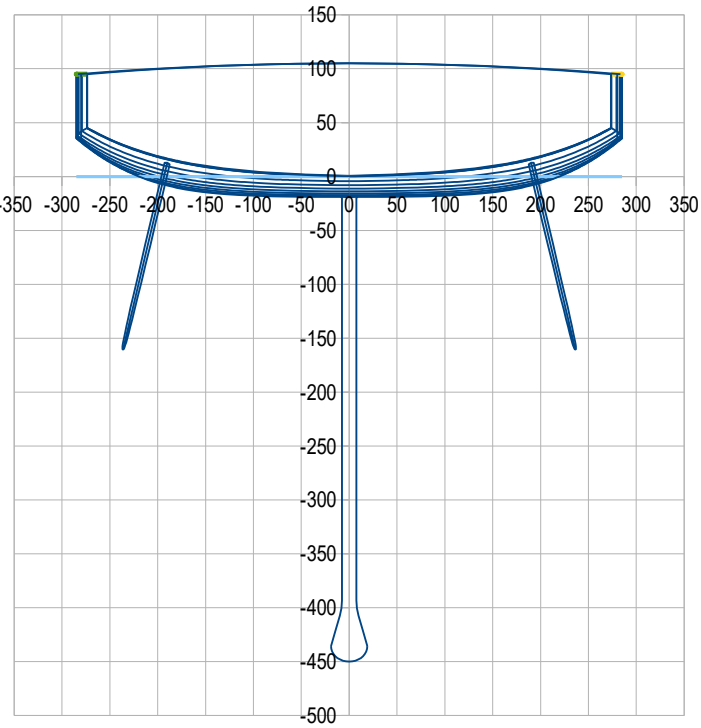
I60 hc, inspired by Imoca 60 designs *with UE 2,3*

Loa 18,28 m ; Lwl 18,00 m ; B 5,70 m ; Draft 4,50 m ; Keel-bulb 3503 kg ; Displacement : 8040 kg









2. Data sum-up and results of hydrostatic and surfaces calculations

2.1 Hull

Loa (m)	**18,28**	**Lwl (m)**	**18,00**					
>> ft	*59,97*		*59,06*					
B (m)	**5,70**	**at X (% Lwl)**	**25,0**					
>> ft	*18,71*							
Bwl (m)	**4,39**	**at X (% Lwl)**	**39,0**	> Bwl/B	0,770			
>> ft	*14,41*			**Freeboards (m) >**		**Aft**	**Midship**	**Fore**
Tc (m)	**0,195**	**at X (%Lwl)**	**50,0**			**0,45**	**0,35**	**1,05**
>> ft	*0,64*				*>> ft*	*1,48*	*1,15*	*3,44*
Displacement at H0 (m3)	**7,32849**	**at Xc (m)**	**8,678**	**Xc (%Lwl)**	**48,21**	**Zc (m)**	**-0,075**	
>> lbs	*16560*	*w. seawater*	*1025*	*kg/m3*		*>> ft*	*-0,25*	
Disp at H(cm)	-2,74	5,78777	at Xc (m)	8,800	Xc (%Lwl)	48,89	Zc (m)	-0,061
Disp at H(cm)	2,74	8,96709	at Xc (m)	8,561	Xc (%Lwl)	47,56	Zc (m)	-0,089
Cp (%)	**60,21**							
Sf (m2)	**58,44**	**at Xf (m)**	**8,111**	**Xf (%Lwl)**	**45,06**	>>> Xc – Xf (%Lwl)		3,15
>> ft2	*629,05*	*>> ft*	*26,61*					
Angle immersed sheer li (°)	**18,7**	at section C4 (40% Lwl)						
Sw (m2)	**58,55**	>Sm/D^(2/3)	15,52					
>> ft2	*630,27*							
Shull (m2)	**108,84**	**at X (m)**	**7,977**	**Z (m)**	**0,106**			
>> ft2	*1 171,59*	*>> ft*	*26,17*	*>> ft*	*0,35*			
Sdeck (m2)	**81,39**	**at X (m)**	**7,418**					
>> ft2	*876,02*	*>> ft*	*24,34*					

2.2 Keel

Vol. keel (m3)	**0,33500**	**at X (m)**	**9,047**	**X (%Lwl)**	**50,26**	**Z (m)**	**-1,991**	
Mass keel(kg)	**2445,47**	*>> ft*	*29,68*			*>> ft*	*-6,53*	
>> lbs	*5391*							
Vol. Bulb(m3)	**0,14485**	**at X (m)**	**8,635**	**X (%Lwl)**	**47,97**	**Z (m)**	**-4,289**	
Mass bulb(kg)	**1057,41**	*>> ft*	*28,33*			*>> ft*	*-14,07*	
>> lbs	*2331*							
Draft oa (m)	**4,50**		**Sw (m2)**	**9,87**		**Sxz (m2)**	**4,04**	
>> ft	*14,76*		*>> ft2*	*106,24*		*>> ft2*	*43,44*	
LCR (m)	**9,20**	**LCR (%Lwl)**	**51,14**					
>> ft2	*99,08*	method : keel profile extended to the waterline, LCR at 25% chord and 45% draft oa						

2.3 Rudder(s)

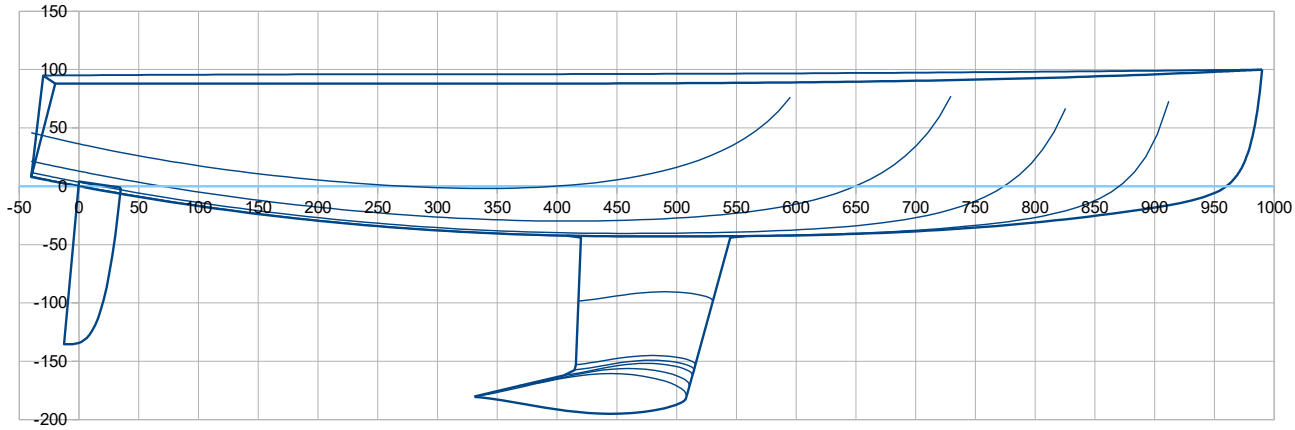
Number	**2**							
Volume (m3)	**0,03563**	**at X (m)**	**0,124**	**X (%Lwl)**	**0,69**	**Z (m)**	**-0,639**	
Sw (m2)	**2,35**	*>> ft*	*0,41*			**Sxz (m2)**	**0,57**	per rudder
>> ft2	*25,30*					*>> ft2*	*6,08*	

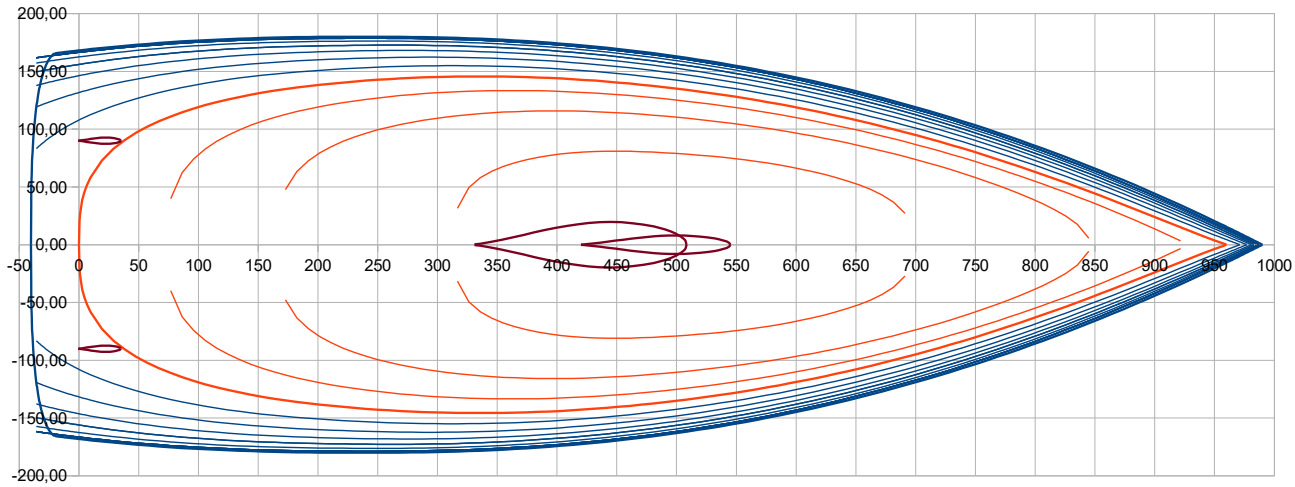
2.4 Hull + Keel + Rudder(s)

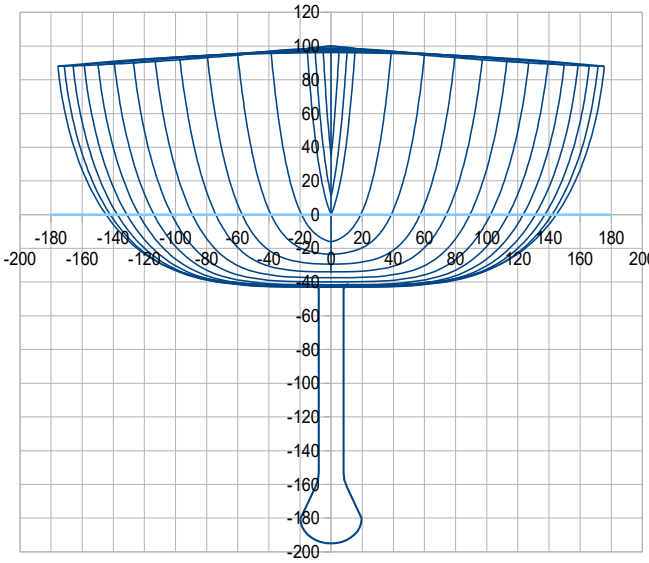
Displacement at H0 (m3)	**7,84397**	**at Xc (m)**	**8,654**	**Xc (%Lwl)**	**48,08**	**Zc (m)**	**-0,237**	
(kg)	**8040**	*>> ft*	*28,39*			*>> ft*	*-0,78*	
>> lbs	*17725*							
Ballast (kg)	**3503**	**at Xg (m)**	**8,923**	**Xg (%Lwl)**	**49,57**	**Zg (m)**	**-2,684**	
>> lbs	*7722*	*>> ft*	*29,27*			*>> ft*	*-8,81*	
>> % Ballast	43,6							
Sw (m2)	**70,77**	>Sw/D^(2/3)	17,93	Lwl/D^(1/3)	9,06			
>> ft2	*761,81*			*M/(Lwl/100)^3*	*39*	*tons, feet*		

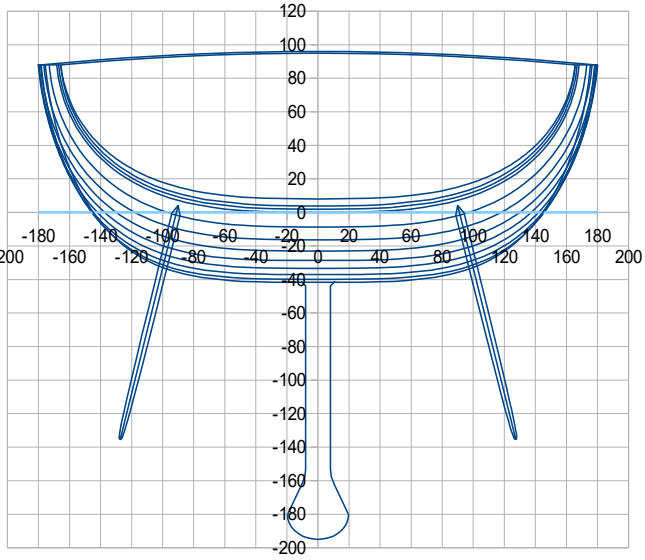
D34, inspired by Delher 34 / Judel-Vrolijk *with UE 2,3*

Loa 10,30 m ; Lwl 9,60 m ; B 3,60 m ; Draft 1,95 m ; Keel-bulb 2100 kg ; Displacement : 5952 kg









2. Data sum-up and results of hydrostatic and surfaces calculations

2.1 Hull

Loa (m)	**10,30**	**Lwl (m)**	**9,60**						
>> ft	*33,79*		*31,50*						
B (m)	**3,60**	**at X (% Lwl)**	**25,0**						
>> ft	*11,81*								
Bwl (m)	**2,91**	**at X (% Lwl)**	**35,0**	> Bwl/B	0,809				
>> ft	*9,56*				**Freeboards (m) >**		**Aft**	**Midship**	**Fore**
Tc (m)	**0,43**	**at X (%Lwl)**	**50,0**				**0,88**	**0,88**	**1,00**
>> ft	*1,41*					*>> ft*	*2,89*	*2,89*	*3,28*
Displacement at H0 (m3)		**5,54942**	**at Xc (m)**	**4,490**	**Xc (%Lwl)**		**46,77**	**Zc (m)**	**-0,166**
	>> lbs	*12540*	*w. seawater*	*1025*	*kg/m3*			*>> ft*	*-0,54*
Disp at H(cm)	-3,00	4,95620	at Xc (m)	4,529	Xc (%Lwl)		47,18	Zc (m)	-0,154
Disp at H(cm)	3,00	6,16710	at Xc (m)	4,450	Xc (%Lwl)		46,36	Zc (m)	-0,178
Cp (%)	**58,76**								
Sf (m2)	**20,32**	**at Xf (m)**	**4,107**	**Xf (%Lwl)**	**42,78**		>>> Xc – Xf (%Lwl)		3,99
>> ft2	*218,71*	*>> ft*	*13,47*						
Angle immersed sheer li (°)		**26,6**	at section C4 (40% Lwl)						
Sw (m2)	**21,94**	>Sm/D^(2/3)	7,00						
>> ft2	*236,20*								
Shull (m2)	**42,91**	**at X (m)**	**4,318**	**Z (m)**	**0,060**				
>> ft2	*461,84*	*>> ft*	*14,17*	*>> ft*	*0,20*				
Sdeck (m2)	**27,77**	**at X (m)**	**3,896**						
>> ft2	*298,86*	*>> ft*	*12,78*						

2.2 Keel

Vol. keel (m3)	**0,12694**	**at X (m)**	**4,836**	**X (%Lwl)**	**50,38**	**Z (m)**	**-0,954**	
Mass keel(kg)	**926,69**	*>> ft*	*15,87*			*>> ft*	*-3,13*	
>> lbs	*2043*							
Vol. Bulb(m3)	**0,10339**	**at X (m)**	**4,473**	**X (%Lwl)**	**46,59**	**Z (m)**	**-1,769**	
Mass bulb(kg)	**1173,47**	*>> ft*	*14,67*			*>> ft*	*-5,80*	
>> lbs	*2587*							
Draft oa (m)	**1,95**		**Sw (m2)**	**4,71**		**Sxz (m2)**	**1,62**	
>> ft	*6,40*		*>> ft2*	*50,70*		*>> ft2*	*17,39*	
LCR (m)	**5,05**	**LCR (%Lwl)**	**52,55**					
>> ft2	*54,30*	method : keel profile extended to the waterline, LCR at 25% chord and 45% draft oa						

2.3 Rudder(s)

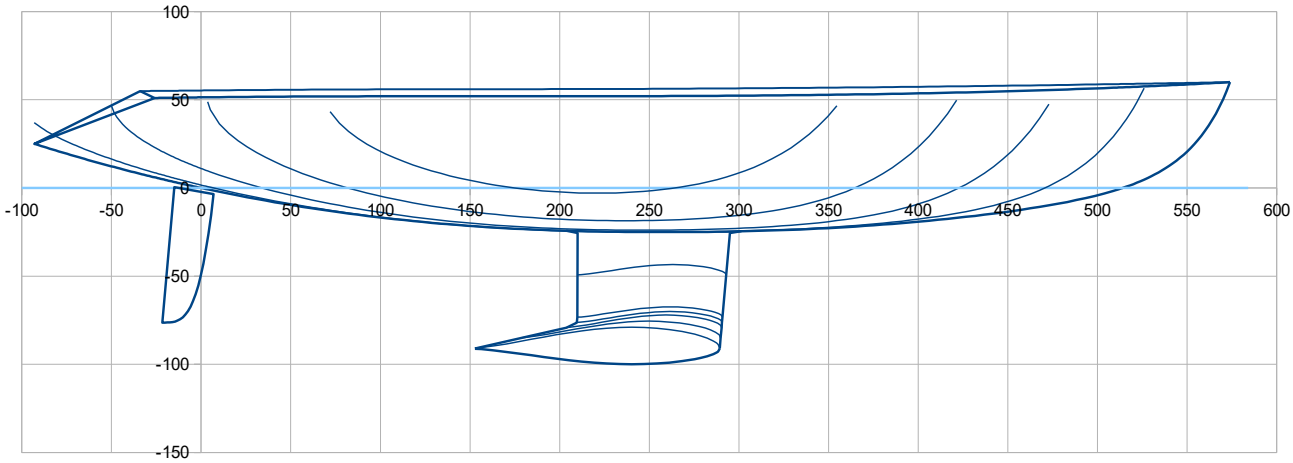
Number	**2**							
Volume (m3)	**0,02679**	**at X (m)**	**0,134**	**X (%Lwl)**	**1,39**	**Z (m)**	**-0,588**	
Sw (m2)	**1,83**	*>> ft*	*0,44*			**Sxz (m2)**	**0,44**	per rudder
>> ft2	*19,68*					*>> ft2*	*4,73*	

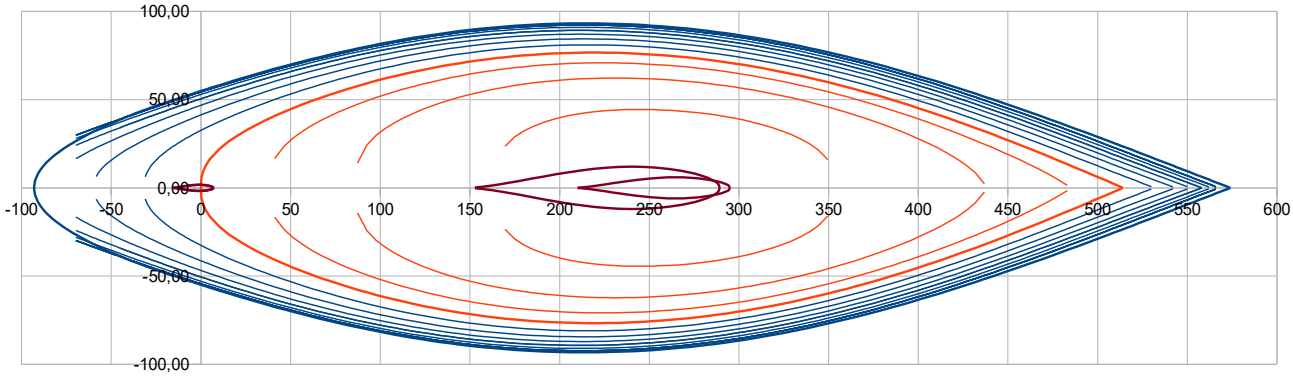
2.4 Hull + Keel + Rudder(s)

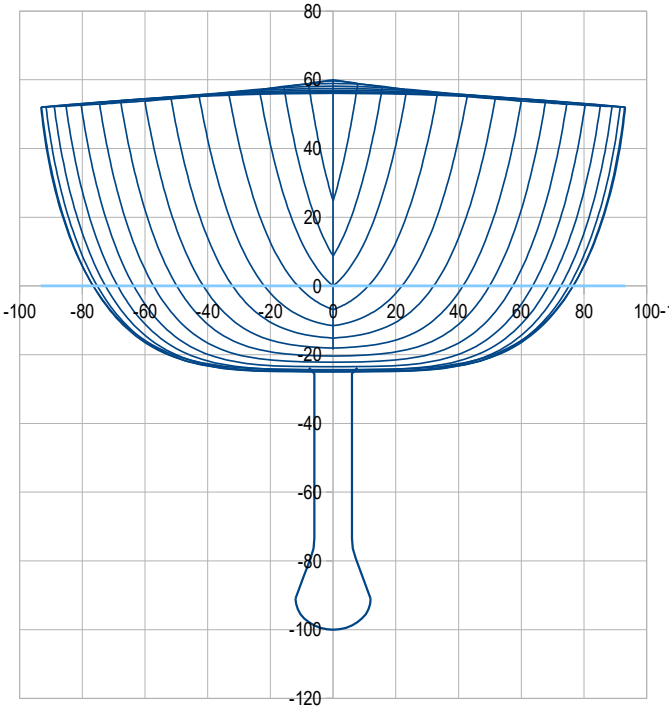
Displacement at H0 (m3)		**5,80654**	**at Xc (m)**	**4,477**	**Xc (%Lwl)**	**46,64**	**Zc (m)**	**-0,214**
	(kg)	**5952**	*>> ft*	*14,69*			*>> ft*	*-0,70*
	>> lbs	*13121*						
	Ballast (kg)	**2100**	**at Xg (m)**	**4,633**	**Xg (%Lwl)**	**48,26**	**Zg (m)**	**-1,409**
	>> lbs	*4630*	*>> ft*	*15,20*			*>> ft*	*-4,62*
>> % Ballast		35,3						
	Sw (m2)	**28,48**	>Sw/D^(2/3)	8,82	Lwl/D^(1/3)	5,34		
	>> ft2	*306,58*			*M/(Lwl/100)^3*	*190*	*tons, feet*	

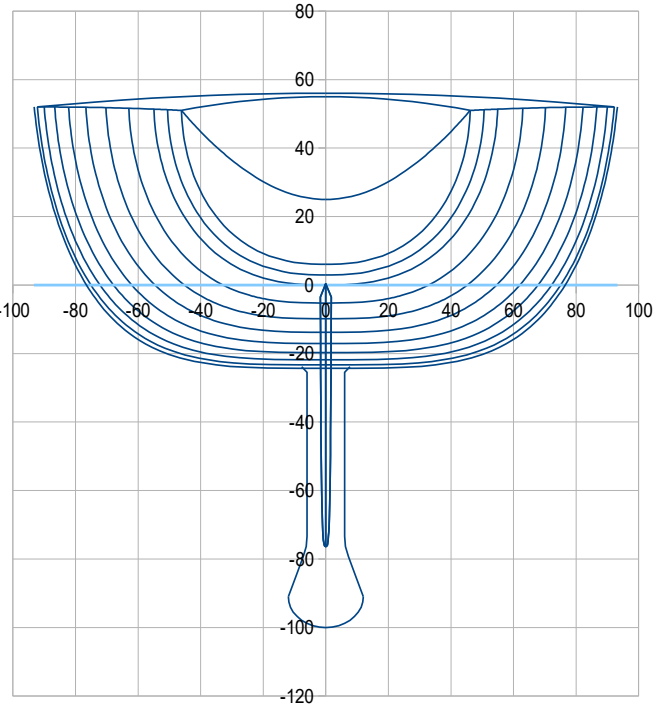
15m2 SNS, inspired by this Switzerland metric class, by Seb Schmidt and Ruedi Stadelman designs. *with UE 2,3*

Loa 6,67 m ; Lwl 5,14 m ; B 1,87 m ; Draft 1,00 m ; Keel-bulb 592 kg ; Displacement : 969 kg









2. Data sum-up and results of hydrostatic and surfaces calculations

2.1 Hull

Loa (m)	**6,67**	**Lwl (m)**	**5,14**						
>> ft	*21,88*		*16,86*						
B (m)	**1,87**	**at X (% Lwl)**	**42,0**						
>> ft	*6,12*								
Bwl (m)	**1,53**	**at X (% Lwl)**	**43,0**	> Bwl/B	0,822				
>> ft	*5,03*					**Freeboards (m) >**	**Aft**	**Midship**	**Fore**
Tc (m)	**0,25**	**at X (%Lwl)**	**50,0**				**0,51**	**0,52**	**0,60**
>> ft	*0,82*					*>> ft*	*1,67*	*1,71*	*1,97*
Displacement at H0 (m3)	**0,87986**	**at Xc (m)**	**2,440**	**Xc (%Lwl)**	**47,47**		**Zc (m)**	**-0,097**	
>> lbs	*1988*	*w. seawater*	*1025*	*kg/m3*			*>> ft*	*-0,32*	
Disp at H(cm)	-3,00	0,72094	at Xc (m)	2,457	Xc (%Lwl)	47,80	Zc (m)	-0,085	
Disp at H(cm)	3,00	1,04863	at Xc (m)	2,423	Xc (%Lwl)	47,14	Zc (m)	-0,109	
Cp (%)	**55,26**								
Sf (m2)	**5,48**	**at Xf (m)**	**2,346**	**Xf (%Lwl)**	**45,63**	>>> Xc – Xf (%Lwl)		1,84	
>> ft2	*58,96*	*>> ft*	*7,70*						
Angle immersed sheer li (°)	**29,2**	at section C4 (40% Lwl)							
Sw (m2)	**6,00**	>Sm/D^(2/3)	6,54						
>> ft2	*64,61*								
Shull (m2)	**13,26**	**at X (m)**	**2,367**	**Z (m)**	**0,055**				
>> ft2	*142,75*	*>> ft*	*7,77*	*>> ft*	*0,18*				
Sdeck (m2)	**7,92**	**at X (m)**	**2,331**						
>> ft2	*85,26*	*>> ft*	*7,65*						

2.2 Keel

Vol. keel (m3)	**0,03083**	**at X (m)**	**2,580**	**X (%Lwl)**	**50,20**	**Z (m)**	**-0,492**
Mass keel(kg)	**225,08**	*>> ft*	*8,47*			*>> ft*	*-1,61*
>> lbs	*496*						
Vol. Bulb(m3)	**0,03233**	**at X (m)**	**2,415**	**X (%Lwl)**	**46,99**	**Z (m)**	**-0,881**
Mass bulb(kg)	**366,90**	*>> ft*	*7,92*			*>> ft*	*-2,89*
>> lbs	*809*						
Draft oa (m)	**1,00**		**Sw (m2)**	**1,88**		**Sxz (m2)**	**0,60**
>> ft	*3,28*		*>> ft2*	*20,25*		*>> ft2*	*6,44*
LCR (m)	**2,72**	**LCR (%Lwl)**	**53,01**				
>> ft2	*29,33*	method : keel profile extended to the waterline, LCR at 25% chord and 45% draft oa					

2.3 Rudder(s)

Number	**1**							
Volume (m3)	**0,00269**	**at X (m)**	**-0,062**	**X (%Lwl)**	**-1,21**	**Z (m)**	**-0,332**	
Sw (m2)	**0,30**	*>> ft*	*-0,20*			**Sxz (m2)**	**0,14**	per rudder
>> ft2	*3,21*					*>> ft2*	*1,54*	

2.4 Hull + Keel + Rudder(s)

Displacement at H0 (m3)	**0,94571**	**at Xc (m)**	**2,437**	**Xc (%Lwl)**	**47,41**	**Zc (m)**	**-0,137**	
(kg)	**969**	*>> ft*	*7,99*			*>> ft*	*-0,45*	
>> lbs	*2137*							
Ballast (kg)	**592**	**at Xg (m)**	**2,478**	**Xg (%Lwl)**	**48,21**	**Zg (m)**	**-0,733**	
>> lbs	*1305*	*>> ft*	*8,13*			*>> ft*	*-2,41*	
>> % Ballast	61,1							
Sw (m2)	**8,18**	>Sw/D^(2/3)	8,49	Lwl/D^(1/3)	5,24			
>> ft2	*88,08*			*M/(Lwl/100)^3*	*202*	*tons, feet*		

Annex : Input data for these examples (also stored in the « Hulls storage » sheet)

		« Inspired by » hulls as examples				
1.1 Hull data	*Hull of ref.*	**B52**	**Classic 6mJI**	**S30**	**T37**	**Bow42**
Lenght of waterline :						
Lwl (m)	**8,00**	**11,23**	**7,30**	**9,90**	**8,13**	**9,75**
Maximum draft of the hull body :						
Tc (m)	**0,36**	**0,66**	**0,65**	**0,52**	**0,66**	**0,43**
X Tc (m)	**50,0**	**50**	**50**	**50**	**50**	**50**
Hull bow :						
Xbow (m)	**9,00**	**12,80**	**8,50**	**11,15**	**9,53**	**11,16**
Zbow (m)	**0,78**	**1,23**	**0,8**	**0,89**	**0,96**	**1**
Shape coefficient of the bow :						
Cet	**7,0**	**6,0**	**1,0**	**3,0**	**5,0**	**8,0**
Polynomials of the keel line						
Pui q av	**2,45**	**2,35**	**2,1**	**2,1**	**2,5**	**2**
Pui q ar	**2,35**	**2,2**	**2,2**	**2,15**	**2,37**	**2**
Rear end of the transom :						
X tab ar (m)	**-1,60**	**-3,00**	**-1,70**	**-1,35**	**-1,72**	**-1,50**
Z tab ar (m)	**0,35**	**0,78**	**0,55**	**0,27**	**0,43**	**0,44**
Sheer line, in horizontal projection xy :						
Bg (m)	**1,89**	**2,60**	**2,03**	**2,35**	**3,19**	**2,62**
X Bg (% Lwl)	**48,0**	**48,0**	**45,0**	**45,5**	**41,0**	**42,0**
Alfa (°)	**3,50**	**2,60**	**1,00**	**0,65**	**0,50**	**0,70**
Pui liv y	**2,00**	**2,00**	**2,00**	**2,00**	**2,00**	**2,00**
Cor Pui liv	**0,020**	**0,020**	**0,030**	**0,030**	**0,040**	**0,020**
Pui Cor Pui	**1,60**	**1,60**	**1,00**	**1,00**	**1,00**	**1,00**
X liv ar (m)	**-1,00**	**-2,80**	**-1,60**	**-1,13**	**-1,36**	**-1,00**
Scow	**0,00**	**0,00**	**0,00**	**0,00**	**0,00**	**0,00**
Hard Chine line, in vertical projection xz :						
Type	**0**	**0**	**0**	**0**	**0**	**0**
Z hc av (m)	**0,75**	**0,50**	**0,50**	**0,50**	**0,50**	**0,50**
Z hc m (m)	**0,20**	**0,20**	**0,20**	**0,20**	**0,20**	**0,20**
Z hc ar (m)	**0,42**	**0,50**	**0,50**	**0,50**	**0,50**	**0,50**
Pui hc z	**2**	**1**	**1**	**1**	**1**	**1**
Sheer line, in vertical projection xz :						
Z liv m (m)	**0,65**	**0,90**	**0,66**	**0,70**	**0,80**	**0,78**
Z liv ar (m)	**0,67**	**1,03**	**0,73**	**0,70**	**0,80**	**0,82**
Pui liv z	**2,0**	**3,0**	**3,0**	**3,0**	**3,0**	**3,0**
Deck / central line rear end						
Z p m (m)	**0,72**	**0,97**	**0,70**	**0,74**	**0,88**	**0,86**
X p ar (m)	**-1,20**	**-2,90**	**-1,65**	**-1,22**	**-1,43**	**-1,15**
Z p ar (m)	**0,7**	**1,06**	**0,74**	**0,72**	**0,83**	**0,86**
Pui pont z	**2,0**	**2,0**	**2,0**	**2,0**	**2,0**	**2,0**
Sections						
Sections V :						
C Hv av	**4,17**	**4,17**	**5,125**	**4,20**	**1,60**	**4,00**
C Hv m	**4,62**	**5,10**	**1,700**	**4,14**	**1,10**	**1,05**
C Hv ar	**6,82**	**6,82**	**6,30**	**7,00**	**3,00**	**5,15**
Pui Hv	**3,00**	**3,00**	**3,00**	**3,00**	**3,00**	**4,00**
Pui V av	**6,00**	**6,00**	**2,00**	**4,00**	**1,60**	**2,00**
Pui V ar	**28,00**	**28,00**	**12,00**	**14,00**	**8,50**	**36,00**
Pui Pui V	**1,30**	**1,30**	**1,00**	**2,00**	**0,50**	**0,175**
Cor Pui Pui V	**0,50**	**0,50**	**0,15**	**0,50**	**0,00**	**0,00**
Sections E and combination VE :						
Pui E	**3,00**	**3,00**	**2,80**	**2,00**	**2,00**	**2,80**
mix VE av	**1,00**	**1,00**	**1,00**	**1,00**	**1,00**	**0,25**
mix VE ar	**0,00**	**0,00**	**0,10**	**0,00**	**0,20**	**0,00**
Pui mix VE	**1,00**	**1,00**	**1,00**	**2,25**	**2,00**	**3,00**
1.2 Keel data						
Xq ar (m)	**3,50**	**4,70**	**2,75**	**3,57**	**3,25**	**4,20**
C root (m)	**1,15**	**1,90**	**1,60**	**2,50**	**2,00**	**1,30**
C tip (m)	**0,90**	**1,40**	**1,45**	**1,95**	**1,80**	**1,10**
Th keel (cm)	**14,00**	**18,00**	**16,00**	**12,00**	**16,00**	**16,00**
F angle (°)	**70,00**	**70,00**	**70,00**	**47,00**	**55,00**	**80,00**
C bulb (m)	**1,55**	**2,20**	**2,20**	**2,70**	**2,40**	**2,00**
TH bulb (cm)	**28,00**	**42,00**	**40,00**	**24,00**	**38,00**	**38,00**
Draft oa (m)	**1,75**	**2,50**	**1,66**	**1,55**	**1,83**	**2,00**
naca 00xx	**0**	**0**	**0**	**0**	**0**	**0**
naca 63-0xx	**1**	**1**	**1**	**1**	**1**	**1**
naca 65-0xx	**0**	**0**	**0**	**0**	**0**	**0**
Density Keel	**7,30**	**7,30**	**7,30**	**7,30**	**7,30**	**7,30**
Density Bulb	**7,30**	**7,30**	**11,35**	**7,30**	**11,35**	**11,35**
1.3 Rudder data						
Xr ar (m)	**-0,28**	**-0,24**	**-0,17**	**0,00**	**-0,20**	**-0,20**
C root (m)	**0,38**	**0,48**	**0,35**	**0,38**	**0,35**	**0,35**
t/c (%)	**15,00**	**15,00**	**15,00**	**15,00**	**15,00**	**15,00**
R angle (°)	**85,00**	**85,00**	**85,00**	**85,00**	**82,00**	**82,00**
Zr ar (m)	**1,30**	**1,75**	**1,20**	**1,25**	**1,25**	**1,25**
C roundness	**3,50**	**3,50**	**3,50**	**4,00**	**4,00**	**4,00**
naca 00xx	**0**	**0**	**0**	**0**	**0**	**0**
naca 63-0xx	**1**	**1**	**1**	**1**	**1**	**1**
naca 65-0xx	**0**	**0**	**0**	**0**	**0**	**0**
Nb of rudders	**1**	**1**	**1**	**1**	**1**	**1**
Offset y (m)	**0,00**	**0,00**	**0,00**	**0,00**	**0,00**	**0,00**
Angle (°)	**0,0**	**0,0**	**0,0**	**0,0**	**0,0**	**0,0**

			« Inspired by » hulls as examples				
1.1 Hull data	*Hull of ref.*	*Hull of ref. with Scow*	M32	T10	I60 hc	D34	15m2 SNS
Lenght of waterline :							
Lwl (m)	8,00	8,00	9,09	8,80	18,00	9,60	5,14
Maximum draft of the hull body :							
Tc (m)	0,249	0,246	0,182	0,37	0,195	0,43	0,25
X Tc (%Lwl)	48,00	48,00	50,00	50,00	50,00	50,00	50,00
Hull bow :							
Xbow (m)	8,25	8,60	9,30	9,35	18,15	9,90	5,74
Zbow (m)	0,90	0,90	0,92	0,97	1,05	1,00	0,60
Shape coefficient of the bow :							
Cet	40	40	60	6,5	100	30	8,5
Polynomials of the keel line							
Pui q av	2,35	2,35	2,3	2	2,2	2,7	2,25
Pui q ar	2,2	2,2	2,2	2,00	2,2	2,2	2,25
Rear end of the transom :							
X tab ar (m)	-0,40	-0,40	-0,40	-0,64	-0,13	-0,40	-0,93
Z tab ar (m)	0,059	0,059	0,04	0,14	0,0070	0,080	0,25
Sheer line, in horizontal projection xy :							
Bg (m)	3,38	3,38	1,70	1,67	5,78	3,68	1,84
X Bg (% Lwl)	22,0	22,0	50,0	53,0	22,0	23,0	42,0
Alfa (°)	-0,20	-0,20	6,77	8,75	-0,16	-0,30	0,20
Pui liv y	2,50	2,50	2,00	2,00	2,80	2,40	2,00
Cor Pui liv	0,055	0,055	0,020	0,020	0,055	0,040	0,042
Pui Cor Pui	0,40	0,40	1,6	1	0,40	0,50	1,8
X liv ar (m)	-0,10	-0,10	-0,20	-0,25	-0,06	-0,20	-0,26
Scow	0,05	0,80	0,00	0,00	0,00	0,00	0,00
Hard Chine line, in vertical projection xz :							
Type	1	1	0	0	2	0	0
Z hc av (m)	0,18	0,58	0,78	0,83	0,35	0,88	0,52
Z hc m (m)	0,38	0,38	0,78	0,83	0,350	0,88	0,52
Z hc ar (m)	0,38	0,38	0,78	0,83	0,45	0,88	0,51
Pui hc z	5	3	3	3	2	3	3
Sheer line, in vertical projection xz :							
Z liv m (m)	0,78	0,78	0,78	0,83	0,95	0,88	0,52
Z liv ar (m)	0,78	0,78	0,78	0,83	0,95	0,88	0,51
Pui liv z	3	3	3	3	2,5	3	3
Deck / central line rear end							
Z p m (m)	0,86	0,86	0,83	0,9	1,05	0,96	0,56
X p ar (m)	-0,20	-0,20	-0,30	-0,40	-0,10	-0,30	-0,34
Z p ar (m)	0,85	0,85	0,83	0,9	1,05	0,95	0,55
Pui pont z	2,0	2,0	1,5	2,0	2,5	2,0	2,0
Sections							
Sections U :							
C Hu av	0,25	0,25	0,25	1,00	0,00	0,20	0,40
C Hu ar	0,46	0,46	0,46	1,50	1,00	1,00	0,50
Pui Hu	1,00	1,00	1,00	1,00	0,50	1,00	1,00
Pui U av	8,00	7,00	8,00	10,00	9,40	6,00	3,85
Pui U ar	15,00	14,00	18,90	14,20	6,00	15,28	15,00
Pui Pui U	4,00	4,00	4,00	2,00	4,00	1,50	1,80
Cor Pui Pui U	0,00	0,00	0,00	0,00	0,00	0,00	1,00
Sections E and combination UE :							
Pui E	2,36	2,30	2,30	3,00	2,00	2,480	2,13
mix UE av	0,60	0,60	0,60	1,00	1,00	1,00	0,95
mix UE ar	0,00	0,00	0,30	0,00	1,00	0,30	0,00
Pui mix UE	1,00	1,00	1,00	1,00	1,00	1,00	2,10
1.2 Keel data							
Xq ar (m)	3,48	3,50	4,10	3,90	8,50	4,20	2,10
C root (m)	1,05	1,05	0,58	1,05	1,00	1,25	0,85
C tip (m)	0,80	0,80	0,58	0,76	0,85	1,00	0,81
Th keel(cm)	13,00	13,00	10,00	13,00	15,00	16,00	12,00
F angle (°)	75,00	75,00	90,00	75,00	88,00	75,00	85,00
C bulb (m)	1,54	1,54	1,34	1,54	2,21	1,82	1,40
Th bulb(cm)	26,00	26,00	20,00	26,00	38,00	39,38	24,00
Draft oa (m)	1,75	1,75	2,13	1,90	4,50	1,95	1,00
naca 00xx	0	0	0	0	0	0	0
naca 63-0xx	1	1	1	1	1	1	1
naca 65-0xx	0	0	0	0	0	0	0
Density keel	7,30	7,30	7,30	7,30	7,30	7,30	7,30
Density bulb	7,30	7,30	11,35	11,35	7,30	11,35	11,35
1.3 Rudder data							
Xr ar (m)	0,10	0,10	-0,23	0,00	0,00	0,00	-0,15
C root (m)	0,35	0,35	0,34	0,33	0,35	0,35	0,22
t/c (%)	15,00	15,00	12,00	15,00	15,00	15,00	15,00
R angle (°)	85,00	85,00	85,00	85,00	85,00	85,00	85,00
Zr ar (m)	1,40	1,40	1,40	1,45	1,80	1,45	0,77
C roundness	3,50	3,50	3,50	4,00	3,50	3,50	3,50
naca 00xx	0	0	0	0	0	0	0
naca 63-0xx	1	1	1	1	1	1	1
naca 65-0xx	0	0	0	0	0	0	0
Nb of rudders	2	2	1	2	2	2	1
Offset y (m)	0,90	0,90	0,00	0,80	1,90	0,90	0,00
Angle (°)	18,0	18,0	0,00	15,0	15,0	15,0	0,0