

MEC-E1004 Principles of Naval Architecture

Hydrostatics and Resistance calculations (Delftship)



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Calculating hydrostatics on Delftship

Tips before going to calculations



By this stage you should have your hull surface ready whether on Delftship or imported from somewhere else.



Make sure you have set the right dimensions in project settings



Resistance analysis on Delftship is limited and you should check whether the built-in methods are compatible with your hull.

Design Hydrostatics

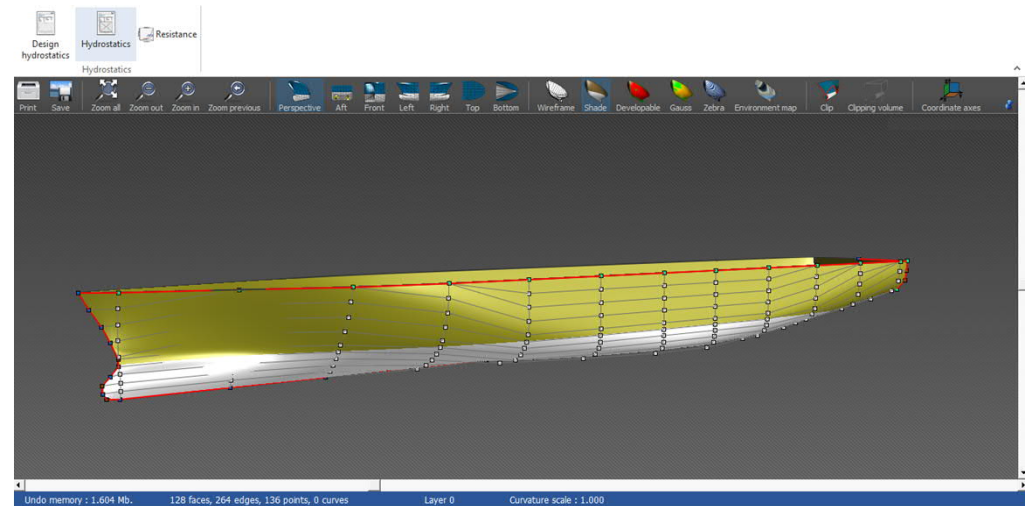
- Calculate you hull's hydrostatic at the design draft. Once you click on Design hydrostatics, a report will be printed

Design hydrostatics report

Haga

Designer	ZA		
Created by			
Comment			
Filename	Haga_on_paras.fbm		
Design length	103.13 (m)	Midship location	51.565 (m)
Length over all	103.13 (m)	Relative water density	1.0250
Design beam	17.440 (m)	Mean shell thickness	0.0150 (m)
Maximum beam	17.453 (m)	Appendage coefficient	1.0000
Design draft	3.000 (m)		

Volume properties		Waterplane properties	
Moulded volume	2678.59 (m ³)	Length on waterline	96.826 (m)
Total displaced volume	2700.62 (m ³)	Beam on waterline	17.441 (m)
Displacement	2768.14 (tonnes)	Entrance angle	1.131 (Degr.)
Block coefficient	0.5261	Waterplane area	1206.0 (m ²)
Prismatic coefficient	0.5852	Waterplane coefficient	0.7048
Vert. prismatic coefficient	0.7404	Waterplane center of floatation	43.023 (m)
Wetted surface area	1468.8 (m ²)	Transverse moment of inertia	24604 (m ⁴)
Longitudinal center of buoyancy	45.204 (m)	Longitudinal moment of inertia	547311 (m ⁴)
Longitudinal center of buoyancy	-6.570 %		
Vertical center of buoyancy	1.723 (m)		



Hydrostatics

- Calculate hydrostatics at various drafts using Hydrostatics button. Set start value, end value and intervals. Click on calculate and then a report with hydrostatics at various drafts will be printed.

The screenshot shows the software interface with the Hydrostatics dialog box open. The dialog box has fields for Draft Range, Start value (0.000), End value (3.000), and Interval (0.5). The background shows a 3D model of a ship hull.

The report on the right is titled "Hydrostatics report" and includes the following data:

Relative water density : 1.0250
Mean shell thickness : 0.0150 (m)

Trim: 0.000 (m)

Draft	Displ FW	Displ.	LCB	VCB	TCB	KMt	KMI	MCT	TpCm
(m)	(tonnes)	(tonnes)	(m)	(m)	(m)	(m)	(m)	(t*m/cm)	(t/cm)
0.000	0.00	0.00	0.000	0.000	0.000	0.000	0.00	0.000	0.000
1.000	620.96	636.49	45.781	0.578	0.000	22.533	408.84	25.197	8.489
2.000	1569.63	1608.87	45.926	1.151	0.000	13.893	258.98	40.222	10.746
3.000	2700.62	2768.14	45.204	1.723	0.000	10.909	206.05	54.844	12.361

NOTE 1: Draft (and all other vertical heights) is measured from base Z=0.000
NOTE 2: All calculated coefficients based on actual dimensions of submerged body.

Nomenclature
Draft: Moulded draft, measured from baseline

Resistance analysis

- Within Delfship Resistance is analyzed with only two methods, Delft series and John Winters (KAPER). You should check if your model is compatible with their criteria. Another method is the Holtrop and Mennen method (in Tutorial 8 you will be provided an *.xls for this).
- Click on Resistance button. Set the speed range and then it will show you a resistance/power curve. You can print a report with tabular values.

