

PORT SERVICE BOAT

LIGHTSHIP WEIGHT & C.G. ESTIMATION

Aluminium 5083-H111, density = 2.691

t/m³

LCG = W.r.t. Fr. -1 (i.e. aft end) (Aft to fore values positive)

TCG = W.r.t. vessel centerline (Values to starboard are positive)

VCG = W.r.t vessel baseline (Values above baseline are positive)

Required LCG = 6.92

m

Sr. No.	Item	Location	Qty	Unit Wt t	Fdn Wt t	Weight t	LCG m	LMMT t.m	VCG m	VMMT t.m	TCG m	TMMT t.m	REMARKS
Hull Structure (Plates)													
1	Total hull plating	-	-	-	-	3.40	8.31	28.26	1.10	3.74	0	0.00	Based on Maxsurf
2	Deck plating	Mdk	-	-	-	1.63	8.31	13.59	2.60	4.25	0	0.00	
3	Transom	Fr. -1	-	-	-	0.26	0.12	0.03	1.39	0.37	0	0.00	
4	Bhd	Fr. 1	-	-	-	0.25	1.65	0.41	1.39	0.35	0	0.00	
5	Bhd	Fr. 10	-	-	-	0.24	9.07	2.16	1.51	0.36	0	0.00	
6	Bhd	Fr. 16	-	-	-	0.26	14.03	3.67	1.56	0.41	0	0.00	
7	Bhd	Fr. 21	-	-	-	0.20	16.50	3.24	1.76	0.35	0	0.00	
8	Chain locker	Fr 19-21	-	-	-	0.19	15.93	3.09	2.00	0.39	0	0.00	
						6.44	8.46	54.44	1.59	10.21	0	0.00	
Hull Structure (Girders)													
9	Center girder - btm	-	-	-	-	0.23	10.37	2.38	0.82	0.19	0	0.00	
10	Center girder - mdk	-	-	-	-	0.23	10.00	2.25	2.45	0.55	0	0.00	
11	Center girder - bhds	-	-	-	-	0.11	8.37	0.90	1.41	0.15	0	0.00	
12	Side (engine) girder btm e/r	-	-	-	-	0.34	5.36	1.83	0.37	0.13	0	0.00	
13	Side girder btm other	-	-	-	-	0.16	6.60	1.05	0.40	0.06	0	0.00	
14	Side girder - mdk	-	-	-	-	0.34	7.53	2.54	2.50	0.84	0	0.00	
15	Side girder - bhds	-	-	-	-	0.18	5.63	1.00	1.48	0.26	0	0.00	
						1.58	7.58	11.95	1.39	2.19	0	0.00	

Sr. No.	Item	Location	Qty	Unit Wt t	Fdn Wt t	Weight t	LCG m	LMMT t.m	VCG m	VMMT t.m	TCG m	TMMT t.m	REMARKS
Hull Structure (Frames)													
16	Bottom frames	-	-	-	-	0.72	11.00	7.95	0.72	0.52	0	0.00	
17	Side frames	-	-	-	-	0.10	8.72	0.92	1.85	0.19	0	0.00	
18	Deck frames	-	-	-	-	0.22	8.72	1.94	2.50	0.56	0	0.00	
19	Trans framing - forepeak	-	-	-	-	0.35	17.50	6.15	1.87	0.66	0	0.00	
						1.40	12.10	16.96	1.37	1.93	0	0.00	
Hull Structure (Longitudinals)													
20	Bottom Longi	-	-	-	-	0.24	8.25	2.02	0.25	0.06	0	0.00	
21	Deck longi	-	-	-	-	0.23	8.30	1.88	2.50	0.57	0	0.00	
22	Side longi	-	-	-	-	0.27	8.40	2.23	1.47	0.39	0	0.00	
23	Bulkhead stiffeners	-	-	-	-	0.22	10.02	2.18	1.60	0.35	0	0.00	
24	Trans stiff - side	-	-	-	-	0.06	16.50	0.94	1.66	0.09	0	0.00	
25	Trans stiff - deck	-	-	-	-	0.06	16.80	0.93	2.65	0.15	0	0.00	
						1.07	9.54	10.17	1.51	1.61	0.00	0.00	
Deckhouse													
26	Plates	-	-	-	-	0.45	9.74	4.38	3.81	1.71	0	0.00	
27	Girder	-	-	-	-	0.09	9.85	0.92	3.86	0.36	0	0.00	
28	Frames	-	-	-	-	0.12	10.35	1.27	3.86	0.47	0	0.00	
29	Stiffeners	-	-	-	-	0.14	10.12	1.44	3.85	0.55	0	0.00	
30	Bhd stiff	-	-	-	-	0.05	6.60	0.35	3.85	0.21	0	0.00	
						0.86	9.71	8.36	3.83	3.30	0.00	0.00	
Miscellaneous structure													
31	Anchor pocket/hawse pipe	-	-	-	-	0.10	17.00	1.76	1.98	0.20	0	0.00	
32	Pillar	-	-	-	-	0.03	6.60	0.20	1.33	0.04	0	0.00	
33	Brackets etc	-	-	-	-	0.57	8.46	4.80	1.59	0.90	0	0.00	
34	Stern tube	-	2	0.25	0.015	0.53	2.24	1.19	-0.40	-0.21	0	0.00	
35	Welding	-	-	-	-	0.34	8.46	2.88	1.59	0.54	0	0.00	
						1.57	6.89	10.82	0.94	1.47	0.00	0.00	
Total structure weight						12.92	8.73	112.71	1.60	20.70	0.00	0.00	

Sr. No.	Item	Location	Qty	Unit Wt t	Fdn Wt t	Weight t	LCG m	LMMT t.m	VCG m	VMMT t.m	TCG m	TMMT t.m	REMARKS
Machinery (Engine room)													
36	Main Engine (P&S)	-	2	1.84	0.01	3.70	5.65	20.91	1.12	4.14	0.00	0.00	MAN - D2842 (LE419) - 440 Kw
37	Gear Box	-	2	0.35	0.03	0.76	4.99	3.78	0.70	0.53	0.00	0.00	ZF about 10° output
38	Marine DG set	-	1	0.58	0.03	0.61	3.58	2.17	1.17	0.71	0.00	0.00	About 20 kW
39	Sewage treatment plant	-	1	1.55	0.02	1.57	8.38	13.11	1.20	1.88	0.30	0.47	Suitable for 12 people
40	Service air compressor/rec	-	1	0.20	0.02	0.22	4.36	0.94	0.90	0.19	-0.75	-0.16	
41	Lub oil transfer pump	-	2	0.04	0.01	0.10	4.40	0.44	0.90	0.09	0.00	0.00	
42	Lub oil purifier	-	1	0.35	0.02	0.37	4.45	1.65	0.95	0.35	-0.15	-0.06	
43	Oily bilge separator	-	1	0.35	0.03	0.38	4.50	1.69	0.80	0.30	-0.60	-0.23	
44	FO transfer pump	-	2	0.05	0.02	0.13	7.10	0.92	0.75	0.10	0.00	0.00	
45	Bilge/GS pump	-	1	0.06	0.01	0.07	7.00	0.49	0.90	0.06	-0.50	-0.04	
46	Fire/GS pump	-	1	0.06	0.01	0.07	7.00	0.49	0.90	0.06	0.50	0.04	
47	Fuel oil purifier	-	1	0.35	0.02	0.37	6.50	2.41	0.65	0.24	0.25	0.09	
48	Domestic FW pump	-	1	0.03	0.01	0.04	6.50	0.23	0.65	0.02	-0.80	-0.03	
49	Portable diesel driven pump	-	1	0.20	0.00	0.20	8.93	1.79	0.80	0.16	0.25	0.05	
50	Work bench	-	1	0.06	0.00	0.06	8.67	0.52	1.30	0.08	0.89	0.05	
51	Onboard spares	-	1	0.10	0.02	0.12	7.20	0.83	1.20	0.14	-2.14	-0.25	
52	Engine room supply fans	-	2	0.25	0.01	0.52	7.07	3.67	1.25	0.65	0.00	0.00	
53	Intermediate shaft	-	2	0.15	0.01	0.31	3.50	1.09	0.90	0.28	0.00	0.00	
54	Main shaft	-	2	0.15	0.01	0.32	2.14	0.68	-0.40	-0.13	0.00	0.00	
55	Propeller	-	2	0.05	0.01	0.11	1.37	0.15	-0.30	-0.03	0.00	0.00	
56	Rudder	-	2	0.05	0.01	0.12	0.83	0.10	1.35	0.16	0.00	0.00	
57	Steering gear	-	1	0.18	0.01	0.19	1.46	0.27	1.18	0.22	0.00	0.00	
58	Hydraulic powerpack	-	1	0.13	0.02	0.14	1.54	0.22	1.48	0.21	0.89	0.13	
59	Engine room exhaust fans	-	2	0.14	0.01	0.30	2.14	0.64	2.98	0.89	0.00	0.00	
60	Hydrophore system	-	1	0.15	0.02	0.17	8.71	1.44	1.42	0.23	1.33	0.22	
61	Deck covering and insulation	-	1	2.21	0.02	2.23	5.78	12.88	1.89	4.21	0.00	0.00	
						13.14	5.59	73.49	1.20	15.75	0.02	0.29	
Anchoring/Mooring													
62	Anchors	-	2	0.06	0.01	0.13	17.33	2.25	2.07	0.27	0.00	0.00	
63	Windlass	-	1	0.07	0.02	0.09	15.90	1.35	3.16	0.27	0.00	0.00	vertical windlass with capstan
64	Anchor chain	-	2	0.03	0.01	0.06	16.00	0.96	1.90	0.11	0.00	0.00	
65	Mooring rope	-	3	0.03	0.00	0.08	10.00	0.84	2.80	0.24	0.00	0.00	
66	Mooring bollards	-	6	0.07	0.00	0.42	11.00	4.62	2.80	1.18	0.00	0.00	
						0.78	12.87	10.02	2.65	2.06	0.00	0.00	

Sr. No.	Item	Location	Qty	Unit Wt t	Fdn Wt t	Weight t	LCG m	LMMT t.m	VCG m	VMMT t.m	TCG m	TMMT t.m	REMARKS
Weatherdeck items													
67	Rubber fender (D-D type)	-	2	0.43	0.06	0.99	10.00	9.87	2.50	2.47	0.00	0.00	
68	Tyre fenders	-	16	0.05	0.06	1.82	10.00	18.24	2.00	3.65	0.00	0.00	
69	Hatches	-	3	0.08	0.00	0.24	5.93	1.42	3.00	0.72	-0.23	-0.06	
70	Stairs	-	1	0.03	0.00	0.03	12.30	0.34	1.65	0.05	0.00	0.00	
71	Vert ladders	-	5	0.01	0.00	0.05	6.00	0.30	1.42	0.07	0.00	0.00	
72	Portable ladder	-	1	0.03	0.00	0.03	10.00	0.25	2.80	0.07	0.00	0.00	
						3.15	9.65	30.43	2.23	7.02	-0.02	-0.06	
Wheelhouse/deckhouse fittings													
73	Whelhouse console	-	1	0.75	0.00	0.75	13.70	10.28	3.57	2.68	0.00	0.00	with fittings and equipments
74	Swiveling chair	-	1	0.02	0.00	0.02	13.09	0.26	3.33	0.07	0.00	0.00	shock resistant
75	Crew chairs	-	3	0.02	0.00	0.06	12.16	0.73	3.33	0.20	1.16	0.07	shock resistant
76	Passenger chairs	-	8	0.02	0.00	0.16	8.65	1.38	3.33	0.53	0.00	0.00	shock resistant
77	Marine A/C	-	1	0.06	0.01	0.07	10.67	0.70	4.40	0.29	-1.50	-0.10	indoor and outdoor unit
78	Weathertight door	-	1	0.05	0.00	0.05	7.43	0.37	3.65	0.18	0.00	0.00	
79	Misc items in wheelhouse	-	50	0.00	0.00	0.10	13.70	1.37	3.57	0.36	0.00	0.00	
80	Wheelhouse locker	-	1	0.02	0.00	0.02	10.50	0.21	3.98	0.08	0.00	0.00	
81	Deck covering and insulation	-	1	1.32	0.00	1.32	9.90	13.07	3.97	5.24	0.00	0.00	
						1.80	10.08	18.10	3.87	6.95	-0.02	-0.03	
Under deck crew area fittings													
82	Settee	-	1	0.35	0.00	0.35	12.80	4.48	1.31	0.46	1.45	0.51	
83	Modular toilet	-	1	0.09	0.00	0.09	9.97	0.90	1.81	0.16	2.15	0.19	
84	Wall mounted TV	-	1	0.02	0.00	0.02	14.02	0.21	1.83	0.03	1.50	0.02	
85	Wall mounted oscillating fan	-	1	0.01	0.00	0.01	14.02	0.14	1.80	0.02	1.30	0.01	
86	Wardrobe	-	2	0.08	0.00	0.15	11.85	1.78	1.80	0.27	-2.20	-0.33	
87	Pantry - refrigerator	-	1	0.15	0.00	0.15	11.00	1.65	1.30	0.20	-2.14	-0.32	
88	Pantry - coffee machine	-	1	0.08	0.00	0.08	10.50	0.84	1.80	0.14	-2.40	-0.19	
89	Pantry - soup machine	-	1	0.01	0.00	0.01	10.00	0.10	1.80	0.02	-2.40	-0.02	
90	Pantry - working table	-	1	0.02	0.00	0.02	9.75	0.20	1.00	0.02	-2.00	-0.04	
91	Pantry - water machine	-	1	0.05	0.00	0.05	9.50	0.48	1.20	0.06	-1.80	-0.09	
92	Pantry - rack	-	1	0.01	0.00	0.01	9.00	0.09	1.80	0.02	-1.90	-0.02	
93	Pantry - wash basin	-	1	0.02	0.01	0.03	9.08	0.27	1.20	0.04	-2.10	-0.06	
94	Deck covering and insulation	-	1	1.57	0.01	1.58	11.50	18.16	1.60	2.53	0.00	0.00	
						2.54	11.51	29.29	1.55	3.95	-0.13	-0.34	

Sr. No.	Item	Location	Qty	Unit Wt t	Fdn Wt t	Weight t	LCG m	LMMT t.m	VCG m	VMMT t.m	TCG m	TMMT t.m	REMARKS
Deckhouse top fittings													
95	Mast with lights	-	1	0.75	0.05	0.80	10.49	8.39	6.19	4.95	0.00	0.00	
96	Searchlights	-	2	0.04	0.00	0.07	11.73	0.82	5.10	0.36	0.00	0.00	
97	Magnetic compass	-	1	0.19	0.00	0.19	11.72	2.17	5.40	1.00	0.00	0.00	
98	Sidelights	-	2	0.08	0.00	0.16	11.45	1.83	5.06	0.81	0.00	0.00	
						1.22	10.88	13.21	5.86	7.12	0.00	0.00	
Life saving appliances													
99	Liferafts	-	2	0.15	0.01	0.32	7.50	2.40	5.18	1.66	0.00	0.00	20 persons
100	Lifejackets	-	12	0.00	0.00	0.01	13.68	0.16	3.85	0.05	0.00	0.00	
101	Lifebuoys	-	8	0.00	0.00	0.03	7.90	0.25	3.90	0.12	0.00	0.00	
102	Miscellaneous LSA items	-	25	0.00	0.00	0.05	8.00	0.40	3.90	0.20	0.00	0.00	
						0.41	7.77	3.22	4.89	2.02	0.00	0.00	
Firefighting appliances													
103	Fire hose box	-	4	0.02	0.00	0.08	8.80	0.70	2.00	0.16	0.00	0.00	
104	DCP Extinguisher		4	0.01	0.00	0.05	8.50	0.44	2.20	0.11	0.00	0.00	
105	Foam extinguisher		3	0.02	0.00	0.05	7.50	0.34	1.20	0.05	0.00	0.00	
106	Water extinguisher		2	0.02	0.00	0.03	9.00	0.27	2.00	0.06	0.00	0.00	
107	CO2 Extinguisher		4	0.02	0.00	0.06	10.00	0.64	2.00	0.13	0.00	0.00	
108	Fireman's outfit		1	0.06	0.00	0.06	12.00	0.66	2.90	0.16	0.00	0.00	
109	Spare charges		1	0.20	0.00	0.20	12.00	2.40	2.90	0.58	0.00	0.00	
						0.53	10.37	5.45	2.39	1.26	0.00	0.00	
Hull fittings													
110	Anodes	-	25	0.01	0.00	0.20	9.50	1.90	0.20	0.04	0.00	0.00	
111	Painting	-	1.5	0.02	0.00	0.03	8.30	0.25	1.10	0.03	0.00	0.00	
112	Railing	-	1	0.25	0.00	0.25	9.08	2.29	3.00	0.76	0.00	0.00	
113	Loose tanks	-	3	0.10	0.00	0.30	6.27	1.86	0.95	0.28	0.00	0.00	
						0.78	8.08	6.30	1.43	1.11	0.00	0.00	
Total outfit weight						24.34	7.78	189.51	1.94	47.25	-0.01	-0.13	

Sr. No.	Item	Location	Qty	Unit Wt t	Fdn Wt t	Weight t	LCG m	LMMT t.m	VCG m	VMMT t.m	TCG m	TMMT t.m	REMARKS
Piping systems													
114	Bilge/GS sys (pipes & fittings)	-	1	0.45	0.05	0.50	7.70	3.85	0.80	0.40	0.00	0.00	
115	Firemain/GS (P&F)	-	1	0.40	0.05	0.45	6.20	2.79	1.58	0.71	0.00	0.00	
116	Fuel oil sys (P&F)	-	1	0.35	0.05	0.40	7.06	2.82	0.80	0.32	0.00	0.00	
117	Lube oil sys (P&F)	-	1	0.15	0.05	0.20	6.10	1.22	0.80	0.16	0.00	0.00	
118	FW sys (P&F)	-	1	0.10	0.05	0.15	9.63	1.44	1.10	0.17	0.00	0.00	
119	Air, filling, sounding sys (P&F)	-	1	0.15	0.00	0.15	10.70	1.61	2.50	0.38	0.00	0.00	
120	Exhaust system (P&F)	-	1	0.80	0.00	0.80	1.63	1.30	1.60	1.28	0.00	0.00	
121	Ventillation (P&F)	-	1	0.45	0.00	0.45	8.58	3.86	2.44	1.10	0.00	0.00	
122	Bilge/GS sys (valves)	-	1	0.18	0.00	0.18	7.70	1.39	0.80	0.14	0.00	0.00	
123	Firemain/GS (valves)	-	1	0.16	0.00	0.16	6.20	0.99	1.58	0.25	0.00	0.00	
124	Fuel oil sys (valves)	-	1	0.18	0.00	0.18	7.06	1.27	0.80	0.14	0.00	0.00	
125	Lube oil sys (valves)	-	1	0.08	0.00	0.08	6.10	0.49	0.80	0.06	0.00	0.00	
126	FW sys (valves)	-	1	0.08	0.00	0.08	9.63	0.77	1.10	0.09	0.00	0.00	
127	Air, filling, sounding sys (valves)	-	1	0.15	0.00	0.15	10.70	1.61	2.50	0.38	0.00	0.00	
128	Exhaust system (P&F) (valves)	-	1	0.80	0.00	0.80	1.63	1.30	1.60	1.28	0.00	0.00	
129	Ventillation (P&F) (valves)	-	1	0.75	0.00	0.75	8.58	6.43	2.44	1.83	0.00	0.00	
-						1.78	5.68	10.11	2.01	3.57	0.00	0.00	
Electrical systems													
130	Main switch board	-	1	0.45	0.00	0.45	8.80	3.96	1.20	0.54	0.00	0.00	
131	Electrical cables	-	1	0.80	0.00	0.80	8.80	7.04	2.10	1.68	0.00	0.00	
132	Cable trays	-	1	0.35	0.00	0.35	8.80	3.08	1.90	0.67	0.00	0.00	
133	Main transformers	-	4	0.10	0.00	0.40	9.00	3.60	1.75	0.70	0.00	0.00	
134	Batteries	-	1	0.15	0.00	0.15	6.50	0.98	1.10	0.17	0.00	0.00	
-						2.15	8.68	18.66	1.74	3.75	0.00	0.00	

Total lightship summary													
	Total structure weight	-	-	-	-	12.92	8.73	112.71	1.60	20.70	0.00	0.00	
	Total outfit weight	-	-	-	-	24.34	7.78	189.51	1.94	47.25	-0.01	-0.13	
	Total piping weight	-	-	-	-	1.78	5.68	10.11	2.01	3.57	0.00	0.00	
	Total electrical	-	-	-	-	2.15	8.68	18.66	1.74	3.75	0.00	0.00	
	Total Lightship weight					41.19	8.04	330.98	1.83	75.28	0.00	-0.13	

Sr. No.	Item	Location	Qty	Unit Wt t	Fdn Wt t	Weight t	LCG m	LMMT t.m	VCG m	VMMT t.m	TCG m	TMMT t.m	REMARKS
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Loaded displacement													
	Total Lightship weight	-	-	-	-	41.19	8.04	330.98	1.83	75.28	0.00	-0.13	
	Crew	-	-	-	-	0.30	12.64	3.79	3.30	0.99	0.00	0.00	
	Passengers	-	-	-	-	0.60	8.60	5.16	3.30	1.98	0.00	0.00	
	Fuel oil	-	-	-	-	1.25	8.22	10.27	1.10	1.37	0.00	0.00	
	Fresh water	-	-	-	-	1.08	8.00	8.62	1.10	1.19	0.00	0.00	
	Fully loaded displacement					44.42	8.08	358.83	1.82	80.81	-0.003	-0.13	