
 Results of Resistance Tests

Project Name : 13K PC
 Ship Model ID : KS2048
 Test Date : 18-APR-23
 Test Option : Fin
 Test Draught : Ballast
 Scale Ratio : 19.200

Ship Particulars

 Length BP = 122.00 m
 Length WL = 122.26 m
 Draught at FP = 4.87 m
 Draught at AP = 5.73 m
 Breadth = 21.00 m
 Wetted Surface Area = 3042.8 m2
 Displacement Volume = 9978.3 m3
 Bilge Keel Area = 40.80 m2
 T.Proj Area abv WL = 410.60 m2
 Hull Roughness(e6) = 150. m
 Ca*1000 = 0.1800
 Cas*1000 = 0.0000
 Cair*1000 = 0.1349

Water Temperature = 14.50 Deg C
 Standard Temp = 15.00 Deg C
 Density (Fresh) = 999.18 kg/m3
 Density (Sea) = 1026.02 kg/m3
 Viscosity (Fresh) = 1.15376e-6 m2/s
 Viscosity (Sea) = 1.18919e-6 m2/s

Vs (kts)	Vm (m/s)	Fn	Rnm (e-6)	Rtm (N)	Ctm (e+3)	Cfm (e+3)	Cr (e+3)	Trim (deg)
11.00	1.291	0.163	7.128	28.97	4.212	3.185	1.028	-0.006
12.00	1.409	0.178	7.775	35.22	4.303	3.136	1.168	-0.005
13.00	1.526	0.193	8.423	42.27	4.400	3.091	1.309	-0.004
14.00	1.644	0.208	9.071	49.88	4.477	3.051	1.426	-0.002
15.00	1.761	0.223	9.719	58.16	4.548	3.015	1.533	0.002
16.00	1.878	0.238	10.367	68.23	4.689	2.981	1.708	0.011

Vs (kts)	Rns (e-9)	Cfs (e+3)	Cts (e+3)	Rts (kN)	PE (kW)	PE (PS)	Sinkage	
							FP (m)	AP
11.00	0.582	1.639	3.006	150	850	1156	0.103	0.116
12.00	0.635	1.621	3.127	186	1149	1562	0.127	0.137
13.00	0.688	1.604	3.252	227	1518	2064	0.152	0.160
14.00	0.740	1.589	3.354	272	1956	2659	0.179	0.183
15.00	0.793	1.576	3.447	320	2472	3361	0.212	0.207
16.00	0.846	1.563	3.609	382	3142	4271	0.257	0.233

Trim by bow is defined to be positive.

Results of Self Propulsion Tests

Project Name : 13K PC
 Ship Model ID : KS2048
 Propeller ID : KP2015
 Test Date : 18-APR-23
 Test Option : Fin
 Test Draught : Ballast
 Scale Ratio : 19.200

Ship Particulars

Length BP = 122.00 m
 Length WL = 122.26 m
 Draught at FP = 4.87 m
 Draught at AP = 5.73 m
 Breadth = 21.00 m
 Wetted Surface Area = 3042.8 m²
 Displacement Volume = 9978.3 m³
 Bilge Keel Area = 40.80 m²
 T.Proj Area abv WL = 410.60 m²

Temp Density Viscosity
 (DegC) (kg/m³) (m²/s)

Res 14.5 999.2 1.15376e-6
 S-P 14.5 999.2 1.15376e-6
 Sea 15.0 1026.0 1.18919e-6

Model-Ship Correlation

Prop Roughness = 30.e-6 m
 Hull Roughness = 150.e-6 m

Propeller Particulars

Number of Propeller = 1
 Number of Blades = 4
 Propeller Diameter = 4.80 m
 Pitch/Dia at 0.7r = 0.776
 Chord Length at 0.7r = 1.358 m
 Blade thickness 0.7r = 0.055 m
 Rn(model) at 0.7r = 6.03e+5
 Expanded Area Ratio = 0.500
 Section Type : NACA66
 Test Date : 10-Nov-22

Ship Speed (kts)	Model Speed (m/s)	Rtm S-P (N)	SFC (N)	S-P Adv (J)	Rate Revs (rps)	Thrust (N)	Torque (N-m)	Model Open Water (J)	Propeller Character (10kt)	
11.00	1.291	28.97	9.39	0.513	6.06	25.17	0.824	0.000	3.758	4.045
12.00	1.409	35.22	10.93	0.508	6.71	31.27	1.016	0.050	3.592	3.908
13.00	1.526	42.27	12.56	0.502	7.38	38.33	1.238	0.100	3.414	3.759
14.00	1.644	49.88	14.28	0.497	8.04	45.99	1.479	0.150	3.227	3.601
15.00	1.761	58.16	16.11	0.493	8.70	54.41	1.744	0.200	3.034	3.437
16.00	1.878	68.23	18.02	0.485	9.44	65.12	2.079	0.250	2.836	3.268
								0.300	2.635	3.094
								0.350	2.432	2.917
								0.400	2.228	2.737
								0.450	2.020	2.551
								0.500	1.810	2.358
								0.550	1.595	2.156
								0.600	1.373	1.943
								0.650	1.143	1.714
								0.700	0.901	1.465
								0.750	0.643	1.192
								0.800	0.365	0.888
								0.850	0.063	0.548
								0.860	0.000	0.476

 Propulsion Performance of Full Scale Ship

Project Name	: 13K PC	Ship Particulars	
Ship Model ID	: KS2048		
Propeller ID	: KP2015	Length BP	= 122.00 m
Test Date	: 18-APR-23	Length WL	= 122.26 m
Test Option	: Fin	Draught at FP	= 4.87 m
Test Draught	: Ballast	Draught at AP	= 5.73 m
Scale Ratio	: 19.200	Breadth	= 21.00 m
		Wetted Surface Area	= 3042.8 m2
		Displacement Volume	= 9978.3 m3
		Bilge Keel Area	= 40.80 m2
		T.Proj Area abv WL	= 410.60 m2

ITTC Standard Prediction

Ship Speed (kts)	Fn	PE (kW)	PD (kW)	S-P Adv (J)	Rate Revs (rpm)	Thrust (kN)	Torque (kN-m)	Model Wake (Wtm)	Ship Wake (Wts)
11.00	0.163	850	1117	0.533	87.56	193	122	0.398	0.340
12.00	0.178	1149	1519	0.527	96.76	239	150	0.395	0.339
13.00	0.193	1518	2025	0.521	106.14	293	182	0.393	0.339
14.00	0.208	1956	2624	0.516	115.41	351	217	0.392	0.339
15.00	0.223	2472	3338	0.511	124.72	414	256	0.391	0.339
16.00	0.238	3142	4287	0.503	134.91	495	303	0.391	0.340

Ship Speed (kts)	Thrust Deduct (Thdf)	Hull Effi (EtaH)	Relative Effi (EtaR)	Prop Effi (EtaO)	Behind Effi (EtaB)	Total Effi (EtaD)	Full Scale Open Water (J)	Propeller Water Character (10Kt)	Character (100Kq)
11.00	0.222	1.178	1.004	0.643	0.646	0.761	0.000	3.761	4.017
12.00	0.223	1.175	1.008	0.639	0.644	0.756	0.050	3.595	3.880
13.00	0.225	1.172	1.010	0.633	0.640	0.750	0.100	3.417	3.731
14.00	0.226	1.171	1.011	0.630	0.636	0.745	0.150	3.230	3.574
15.00	0.227	1.170	1.011	0.626	0.633	0.741	0.200	3.037	3.410
16.00	0.229	1.169	1.010	0.621	0.627	0.733	0.250	2.839	3.241
							0.300	2.638	3.067
							0.350	2.435	2.890
							0.400	2.231	2.710
							0.450	2.023	2.524
							0.500	1.813	2.331
							0.550	1.598	2.129
							0.600	1.375	1.916
							0.650	1.145	1.687
							0.700	0.903	1.438
							0.750	0.645	1.166
							0.800	0.367	0.862
							0.850	0.065	0.522
							0.860	0.002	0.450

Prediction of Powering Performance

Project Name	: 13K PC	Ship Particulars	
Ship Model ID	: KS2048		
Propeller ID	: KP2015	Length BP	= 122.00 m
Test Date	: 18-APR-23	Length WL	= 122.26 m
Test Option	: Fin	Draught at FP	= 4.87 m
Test Draught	: Ballast	Draught at AP	= 5.73 m
Scale Ratio	: 19.200	Breadth	= 21.00 m
		Wetted Surface Area	= 3042.8 m ²
		Displacement Volume	= 9978.3 m ³
		Bilge Keel Area	= 40.80 m ²
		T.Proj Area abv WL	= 410.60 m ²

Ship Trial Prediction with
Ca*1000 = 0.1800, EtaT =0.970

Ship Speed (kts)	Brake Horsepower		Rate of Revs.	
	(kW)	(PS)	(rps)	(rpm)
11.00	1152	1566	1.459	87.56
12.00	1565	2128	1.613	96.76
13.00	2087	2838	1.769	106.14
14.00	2705	3678	1.924	115.41
15.00	3441	4679	2.079	124.72
16.00	4420	6009	2.248	134.91
[Trials] Vs = 14.38 kts, Ns = 118.9 rpm at Pb = 2970 kW				
[Service] Vs = 13.81 kts with Sea Margin = 15.0 %				

[Notes]

- For the explanation of abbreviations, see the list of symbols.
- Analysis method : Based on 1978 ITTC performance prediction method
- Frictional resistance determined according to the ITTC-1957 formula.
- Reynolds and Froude number based on Lwl=122.26.
- A model-ship correlation allowance(2-D), Ca=0.00018.
- w/o CP-CN correction.
- A resistance of above water part through the air, Cair=.0001349.
- The results are valid for unrestricted deep water of 15.0 deg C and a mass density of 1026.0 kg/m³, clean surfaces of hull and propeller blades and no effects of wind and waves.