

APH: **682.8** CDL: **6.410**

GPH: **770.2** CertNo:

BOAT

Class **Friendship 28**
Designer **Koopmans**
Builder **Friendship**
Age date **07/1977**
Series date **04/1977**
Offset file **HC_00702.off**
Data file

HULL

Length Overall **8.400 m**
Maximum Beam **2.714 m**
Draft **1.669 m**
Displacement **3,653 kg**
DLR **9.4272**
IMS Division **Cruiser/Racer**
Dynamic Allowance **0.612%**
Age Allowance **0.487%**

PROPELLER

Installation **Strut**
Type **Feathering 2 blades**
Diameter **0.300m**

CREW

Maximum weight **439 kg**
Minimum weight **329 kg** * when applied
Non Manual Power **No**
Crew Arm Extension

SAIL AREAS (m²)

	Measured	Rated
Mainsail	14.79	14.92
Headsail Luffed	24.99	24.99
Headsail Flying		
Symmetric	48.07	48.07
Asymmetric		

STORM SAIL AREAS (m²)

Trysail **4.74**
Storm Jib **5.16**
Heavy Weather Jib **13.91**

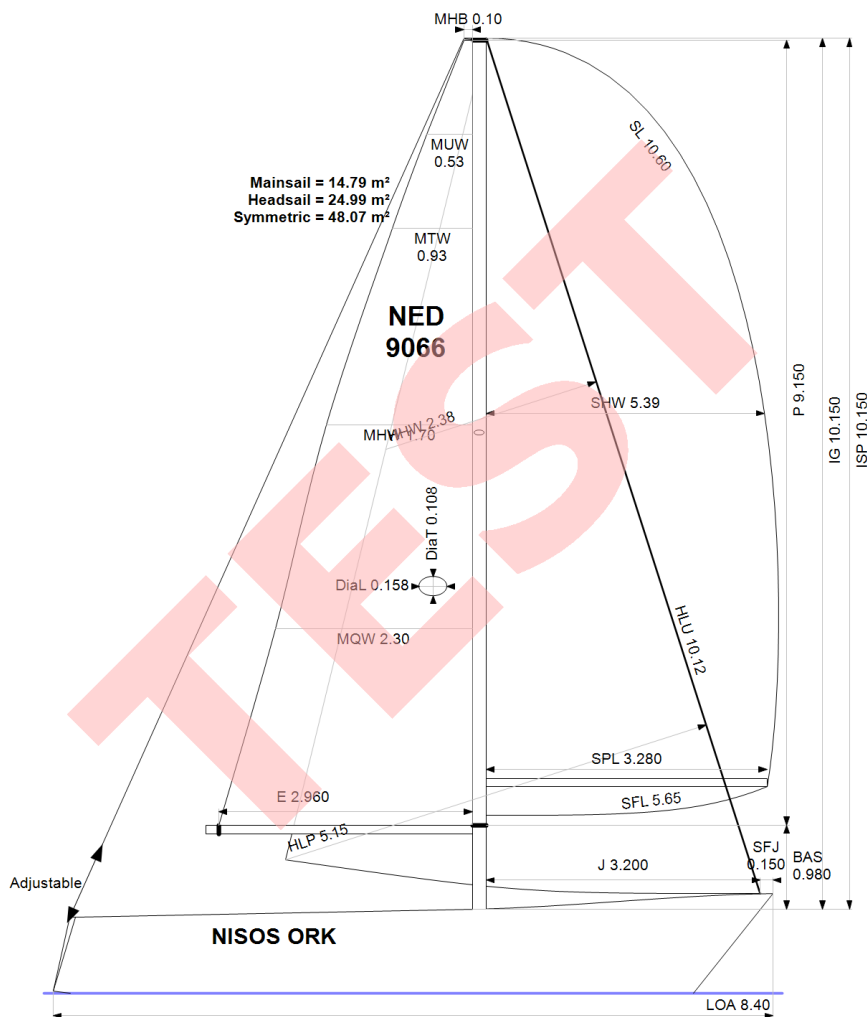
SAIL LIMITS

Headsails **5**
Spinnakers **4**

STABILITY

Righting Moment **50.4 kg·m**
Stability Index **N/A**

The owner and any other person in charge is responsible that boat is complying with her certificate in accordance with RRS 78.1 and ORC Rule 304.



Rated boat velocities in knots

Wind Velocity	6 kt	8 kt	10 kt	12 kt	14 kt	16 kt	20 kt
Beat Angles	43.2°	41.4°	41.2°	41.2°	39.9°	39.3°	38.8°
Beat VMG	2.70	3.25	3.64	4.01	4.27	4.38	4.44
52°	4.14	4.88	5.47	5.85	6.06	6.17	6.24
60°	4.37	5.13	5.70	6.00	6.19	6.32	6.42
75°	4.52	5.32	5.86	6.14	6.32	6.48	6.71
90°	4.47	5.35	5.99	6.30	6.49	6.58	6.89
110°	4.52	5.47	6.08	6.39	6.65	6.92	7.27
120°	4.40	5.33	6.00	6.34	6.60	6.89	7.43
135°	3.99	4.89	5.70	6.15	6.43	6.70	7.28
150°	3.46	4.37	5.14	5.81	6.18	6.44	6.96
Run VMG	2.99	3.79	4.47	5.12	5.67	6.07	6.57
Gybe Angles	148.4°	152.9°	153.8°	158.3°	171.8°	178.1°	179.0°

Time Allowances in secs/NM							
Wind Velocity	6 kt	8 kt	10 kt	12 kt	14 kt	16 kt	20 kt
Beat VMG	1331.6	1109.1	987.7	897.6	843.6	821.5	810.6
52°	868.9	738.4	658.5	615.9	594.4	583.2	577.2
60°	824.3	701.4	631.8	599.7	581.5	569.9	561.1
75°	796.0	676.9	613.8	586.7	569.7	555.9	536.6
90°	806.3	673.0	600.8	571.5	554.9	547.1	522.9
110°	796.9	657.7	592.4	563.7	541.3	520.4	494.9
120°	818.9	675.1	599.7	568.2	545.3	522.6	484.7
135°	902.9	735.8	631.4	585.4	559.9	537.4	494.2
150°	1041.7	824.6	701.0	620.0	582.3	559.1	517.1
Run VMG	1202.8	949.6	806.1	703.3	634.7	592.8	548.1
Selected Courses							
Windward / Leeward	1267.2	1029.4	896.9	800.4	739.2	707.1	679.4
All purpose	983.3	810.0	713.7	655.6	621.1	601.2	576.7

Single Number Scoring Options		
Course	Time On Distance	Time On Time
Windward / Leeward	838.3	0.7157
All purpose	682.8	0.8788

Custom scoring options for Netherlands

Single Number	Time On Time
Triple Number Coastal/Long Distance Low	0.6691
Triple Number Coastal/Long Distance Medium	0.8834
Triple Number Coastal/Long Distance High	1.0050
Triple Number Windward/Leeward Low	0.5225
Triple Number Windward/Leeward Medium	0.7174
Triple Number Windward/Leeward High	0.8514
Coastal/Long Distance	0.8066
Predominantly Upwind	0.8066
Predominantly Downwind	0.8681

Data in meters/kilograms (Metric)

HULL AND APPENDAGES (Lightship Trim)

Class	Friendship 28	LOA	8.400	VCGD	0.046
Measurement	10/07/2019	Max. Beam	2.714	VCGM	0.010
HIN		Draft	1.669	RM Measured (kg·m)	50.4
Plan review		Displacement	3,653	RM Default (kg·m)	50.4
Hull construction	Solid	Wetted area	17.08	Limit of positive stability(°)	N/A
Aramid Hull Core	No	IMS L	7.284	Stability Index	N/A
Carbon Rudder	No	LSM0	7.290		
Light stanchions	No	Acc. length	8.400		
Trim tab	No	Sink (kg/mm)	11.88		

PROPELLER

Propeller Type	Feathering 2 blades			
Installation	Strut	PRD	0.300	EDL ST3
Twin screw	No	PBW		ST1 ST4
Hydro generator	No	PIPA	0.0005	ST2 ST5

RIG

Forestay tension	Aft	P	9.150	E	2.960
Inner stay	None Fitted	IG	10.150	J	3.200
Carbon mast	No	ISP	10.150	BAS	0.980
Headsail furler	No	MDT1	0.108	FSD	Foil
Mainsail furler	No	MDL1	0.158	SFJ	0.150
Articulated bowsprit	No	MDT2		SPL	3.280
Non-circular rigging	No	MDL2		WPL	
Fiber rigging	No	TL	No Taper	TPS	
Runners/Checkstays	0	MW		BD	
Spreaders	1	GO		MWT	
				MCG	

FLOTATION AND STABILITY

Calculation method	VCG estimated	SFFP	0.500	SAFP	8.140
Flotation Date	20/04/2022	FFM		FAM	
Measurer		FF	1.145	FA	0.877
Comment		LCFcl	4.865	LCFsh	5.054
		SG	1.0000	HBI	0.981

INVENTORY

OTHER ITEMS	<i>Id</i>	<i>Kind</i>	<i>Description</i>	<i>Weight</i>	<i>LCG</i>	<i>VCG</i>
	SaS	Deductible	Sailor Services	24	4.44	0.00
	<i>Total deductible</i>			24	4.44	0.00



MAINSAIL

<i>Id</i>	<i>MHB</i>	<i>MUW</i>	<i>MTW</i>	<i>MHW</i>	<i>MQW</i>	<i>Area</i>	<i>Meas.Date</i>	<i>Maker</i>	<i>Material</i>	<i>Comment</i>
ORC1	0.10	0.53	0.93	1.70	2.30	14.79	10/07/2019			

HEADSAIL

<i>Id</i>	<i>HHB</i>	<i>HUW</i>	<i>HTW</i>	<i>HHW</i>	<i>HQW</i>	<i>HLP</i>	<i>HLU</i>	<i>Btn</i>	<i>Flying</i>	<i>FT</i>	<i>Area</i>	<i>Meas.Date</i>	<i>Maker</i>	<i>Material</i>	<i>Comment</i>
ORC1	0.06	0.57	1.14	2.38	3.72	5.15	10.12	No	No		24.99	10/07/2019			

SYMMETRIC SPINNAKER

<i>Id</i>	<i>SLU</i>	<i>SLE</i>	<i>SL</i>	<i>SHW</i>	<i>SFL</i>	<i>Area</i>	<i>Meas.Date</i>	<i>Maker</i>	<i>Material</i>	<i>Comment</i>
ORC1	10.60	10.60	10.60	5.39	5.65	48.07	10/07/2019			