

## ISO Scantling Report

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### Boat Particulars

Craft Type	Motor
Design Category	C, Inshore
Composite Evaluation Level	EL-c, default data with 0.8 factor, ISO fibre content by mass
Displacement, $m_{LDC}$	46628.0 kg
Length of Hull, $L_H$	18.790 metres
Waterline Length, $L_{WL}$	16.130 metres
Waterline Beam, $B_{WL}$	5.230 metres
Chine Beam, $B_C$	5.230 metres
Canoe Body Depth, $T_C$	1.370 metres
Deadrise Angle, $\beta$	16.0 degress
Maximum Speed, $V$	12.0 knots

### General Calculations

Dynamic Load Factor, $n_{CG}$	0.361
Design Category Factor, $k_{DC}$	0.600
Base Bottom Displacement Pressure, $P_{BMD\ BASE}$	103.342 kN/m <sup>2</sup>
Base Bottom Planing Pressure, $P_{BMP\ BASE}$	70.714 kN/m <sup>2</sup>
Base Deck Pressure, $P_{DM\ BASE}$	20.245 kN/m <sup>2</sup>

### Panel Geometry and Calculations

Label	Dimensions and Location							Calculations to ISO Standard					
	Length mm	Width mm	Aspect Ratio	Longitudinal Position metres	Location	z metres	Curvature mm	$k_L$	$k_{AR}$	$k_2$	$k_3$	$k_z$	Design Pressure kN/m <sup>2</sup>
Bottom_FWD	1400	550	2.545	14.200	Bottom	--	0	1.000	0.545	0.500	0.028	--	45.1
Bottom_MID	1400	600	2.333	7.500	Bottom	--	0	0.888	0.528	0.500	0.028	--	38.4
Bottom_AFT	1400	550	2.545	2.000	Bottom	--	0	0.604	0.545	0.500	0.028	--	27.3
Hull Side_01 FWD	1400	800	1.750	14.200	Side	0.000	0	1.000	0.485	0.483	0.027	0.000	8.7
Hull Side_02 FWD	1400	700	2.000	14.200	Side	0.000	0	1.000	0.505	0.497	0.028	0.000	8.7
Hull Side_03 FWD	1400	700	2.000	14.200	Side	0.000	0	1.000	0.505	0.497	0.028	0.000	8.7
Hull Side_01 MID	1400	700	2.000	7.500	Side	0.000	0	0.888	0.505	0.497	0.028	0.000	8.7

Hull Side_02 MID	1400	700	2.000	7.500	Side	0.000	0	0.888	0.505	0.497	0.028	0.000	8.7
Hull Side_03 MID	1400	700	2.000	7.500	Side	0.000	0	0.888	0.505	0.497	0.028	0.000	8.7
Hull Side_01 AFT	1400	700	2.000	2.000	Side	0.000	0	0.604	0.505	0.497	0.028	0.000	8.7
Hull Side_02 AFT	1400	700	2.000	2.000	Side	0.000	0	0.604	0.505	0.497	0.028	0.000	8.7
Hull Side_03 AFT	1400	700	2.000	2.000	Side	0.000	0	0.604	0.505	0.497	0.028	0.000	8.7
Bulkhead	1000	1000	1.000	15.500	Watertight Bulkhead	--	0	--	0.000	0.308	0.014	--	17.5
cabin side	1500	1000	1.500	9.500	Superstructure. Side, non walking area	--	10	--	0.533	0.454	0.024	--	3.2
Deck	1000	1000	1.000	7.500	Deck	--	0	0.888	0.602	0.308	0.014	--	6.5
Roof	1000	1000	1.000	13.000	Superstructure. Upper Tiers, non walking area	--	10	--	0.602	0.308	0.014	--	5.0

## Panel Results

Label	Requirements							Offered								Results								
	t <sub>min</sub>	M <sub>db</sub> N.mm/mm	M <sub>dl</sub> N.mm/mm	EI <sub>b</sub> N.m <sup>2</sup> /mm	w <sub>os</sub> kg/m <sup>2</sup>	w <sub>is</sub> kg/m <sup>2</sup>	Shear Force N/mm	Label	t mm	M <sub>db</sub> N.mm/mm	M <sub>dl</sub> N.mm/mm	EI <sub>b</sub> N.m <sup>2</sup> /mm	w <sub>os</sub> kg/m <sup>2</sup>	w <sub>is</sub> kg/m <sup>2</sup>	Shear Force N/mm	t <sub>min</sub> Ratio	b Min Ply No. and Stress Ratio	I Min Ply No. and Stress Ratio	EI <sub>b</sub> Ratio	w <sub>os</sub> Ratio	w <sub>is</sub> Ratio	Shear Force Ratio	Plating Comply?	Core Comply?
Bottom_FWD	3.04	1138.0	708.9	--	--	--	--	BOTTOM_FWD	13.42	1240.6	1240.6	--	--	--	--	4.413	1, 1.090	1, 1.750	--	--	--	--	yes	--
Bottom_MID	3.04	1151.9	723.7	--	--	--	--	BOTTOM_MID	13.42	1240.6	1240.6	--	--	--	--	4.413	1, 1.077	1, 1.714	--	--	--	--	yes	--
Bottom_AFT	3.04	687.5	428.2	--	--	--	--	BOTTOM_AFT	11.59	904.6	904.6	--	--	--	--	3.812	1, 1.316	1, 2.112	--	--	--	--	yes	--
Hull Side_01 FWD	--	449.1	299.8	0.583	0.952	0.666	3.1	SIDE_FWD	--	1899.8	1899.8	5.219	2.100	1.200	7.0	--	8, 4.231	8, 6.337	8.953	2.206	1.801	2.228	yes	yes
Hull Side_02 FWD	--	353.8	226.8	0.409	0.952	0.666	2.8	SIDE_FWD	--	1899.8	1899.8	5.219	2.100	1.200	7.0	--	8, 5.370	8, 8.377	12.747	2.206	1.801	2.469	yes	yes
Hull Side_03 FWD	--	353.8	226.8	0.409	0.952	0.666	2.8	SIDE_FWD	--	1899.8	1899.8	5.219	2.100	1.200	7.0	--	8, 5.370	8, 8.377	12.747	2.206	1.801	2.469	yes	yes
Hull Side_01 MID	--	353.8	226.8	0.409	0.952	0.666	2.8	SIDE_MID-AFT	--	1899.8	1899.8	5.219	2.100	1.200	7.0	--	8, 5.370	8, 8.377	12.747	2.206	1.801	2.469	yes	yes
Hull Side_02 MID	--	353.8	226.8	0.409	0.952	0.666	2.8	SIDE_MID-AFT	--	1899.8	1899.8	5.219	2.100	1.200	7.0	--	8, 5.370	8, 8.377	12.747	2.206	1.801	2.469	yes	yes
Hull Side_03 MID	--	353.8	226.8	0.409	0.952	0.666	2.8	SIDE_MID-AFT	--	1899.8	1899.8	5.219	2.100	1.200	7.0	--	8, 5.370	8, 8.377	12.747	2.206	1.801	2.469	yes	yes
Hull Side_01 AFT	--	353.8	226.8	0.409	0.952	0.666	2.8	SIDE_MID-AFT	--	1899.8	1899.8	5.219	2.100	1.200	7.0	--	8, 5.370	8, 8.377	12.747	2.206	1.801	2.469	yes	yes
Hull Side_02 AFT	--	353.8	226.8	0.409	0.952	0.666	2.8	SIDE_MID-AFT	--	1899.8	1899.8	5.219	2.100	1.200	7.0	--	8, 5.370	8, 8.377	12.747	2.206	1.801	2.469	yes	yes
Hull Side_03 AFT	--	353.8	226.8	0.409	0.952	0.666	2.8	SIDE_MID-AFT	--	1899.8	1899.8	5.219	2.100	1.200	7.0	--	8, 5.370	8, 8.377	12.747	2.206	1.801	2.469	yes	yes
Bulkhead	--	898.3	897.8	1.201	--	--	5.9	Bulkhead	--	4001.5	4001.5	10.047	--	--	7.4	--	10, 4.454	10, 4.457	8.366	--	--	1.249	yes	yes
cabin side	--	244.7	176.0	0.385	0.740	0.518	1.4	Cabin	--	2312.7	2312.7	5.281	1.650	1.500	6.9	--	7, 9.449	7, 13.139	13.708	2.228	2.894	5.045	yes	yes
Deck	--	333.1	333.0	0.445	0.740	0.518	2.2	Deck	--	2372.8	2372.8	6.103	2.100	1.500	7.1	--	8, 7.122	8, 7.126	13.702	2.836	2.894	3.215	yes	yes
Roof	--	256.7	256.5	0.343	0.740	0.518	1.7	Cabin	--	2312.7	2312.7	5.281	1.650	1.500	6.9	--	7, 9.010	7, 9.015	15.389	2.228	2.894	4.080	yes	yes

## Stiffeners

Label	Dimensions and Location						Calculations to ISO Standard					Requirements				Offered				Results					
	Length mm	Spacing mm	Longitudinal Position metres	Location	z metres	Curvature mm	k <sub>L</sub>	k <sub>AR</sub>	z	k <sub>z</sub>	Design Pressure kN/m <sup>2</sup>	Bending Moment N.m	Shear Force N	EI N.m <sup>2</sup>	t <sub>w</sub> mm	Label	Bending Moment N.m	Shear Force N	EI N.m <sup>2</sup>	t <sub>w</sub> mm	Bending Moment Ratio	Shear Force Ratio	EI Ratio	t <sub>w</sub> Ratio	Comply?
Keel	1400	550	12.000	Bottom	--	0.000	1.000	0.542	--	--	38.4	3444.4	14767.8	3010.3	6.2	(B)KEEL	4226.4	18273.6	87361.5	6.3	1.227	1.237	29.021	1.023	yes
Stringer	1400	500	12.000	Bottom	--	0.000	1.000	0.558	--	--	39.5	3222.1	13814.6	2816.0	6.0	(B)STRINGER	4217.2	18273.6	86557.5	6.3	1.309	1.323	30.738	1.058	yes
Frame (Plate)	4500	1300	9.500	Bottom	--	720.000	0.991	0.284	--	--	24.3	30270.1	71185.3	64040.2	12.3	(B)FRAME-Plate	35796.1	137551.4	2760463.0	9.0	1.183	1.932	43.105	0.729	yes with warning: web shear buckling likely
Frame(Top-Hat)	4500	1200	7.000	Bottom	--	650.000	0.862	0.284	--	--	24.3	30493.4	65709.5	67394.2	13.0	(B)FRAME-Tophat	32219.1	73094.2	1035453.0	12.6	1.057	1.112	15.364	0.970	yes with warning: web shear buckling likely
Frame (Plate)	4800	420	5.000	Bottom	--	650.000	0.759	0.273	--	--	24.3	12732.9	24531.5	30737.6	7.2	(B)FRAME-Plate	35796.1	137551.4	2760463.0	9.0	2.811	5.607	89.807	1.241	yes
BHD stiffener	1000	1000	15.500	Watertight Bulkhead	--	0.000	--	0.000	--	--	11.2	933.0	5600.0	582.4	1.8	BHD FRAME	946.8	14641.6	9478.3	13.1	1.015	2.615	16.275	7.393	yes
Side frame	1400	1000	11.000	Side	0.500	50.000	1.000	0.453	0.500	0.000	8.7	1395.2	6097.1	1207.7	4.8	(S)FRAME	2059.7	12292.0	40173.3	4.2	1.476	2.016	33.264	0.870	yes with warning: web shear buckling likely
Side stringer	1100	600	11.500	Side	1.100	0.000	1.000	0.568	1.100	0.091	8.7	526.8	2874.4	361.7	2.2	(S)STRINGER	588.8	4993.8	6017.8	4.2	1.118	1.737	16.637	1.939	yes
Deck beam	1000	1000	9.500	Deck	--	0.000	0.991	0.401	--	--	5.0	416.5	2500.0	260.0	1.1	(D)FRAME	928.3	17978.0	8177.6	16.7	2.229	7.191	31.452	15.691	yes
Roof beam	1000	1000	13.000	Superstructure. Upper Tiers, non walking area	--	10.000	--	0.401	--	--	5.0	416.5	2500.0	260.0	1.1	(D)FRAME	928.3	17978.0	8177.6	16.7	2.229	7.191	31.452	15.691	yes

Report produced using Wolfson Unit M.T.I.A. HullScant - Hull Scantlings 12215.

Incorporating: International Standard - Hull construction - Scantlings - Part 5: Design pressures for monohulls, design stresses, scantling determination. ISO 12215-5:2008, 2008-04-15