

PLANING CRAFT - PARAMETRIC DESIGN

GEOMETRY:

Length of hull, m	L _H	10
Length of WL, m	L _{WL}	8.5
Beam of hull, m	B _H	2.8
Beam of chine, m	B _C	2.52
Canoe body draft, m	T _C	0.48
Hull depth, m	D	1.4
Volume displacement, m³	V	6.63
Weight displacement, kg	DSPL	6800
Immersion, kg/cm	q	178

From TW:
7023

SHAPE FACTORS:

Transom deadrise angle, deg	β	5
Block coefficient	C _B	0.645
Midship area coefficient	C _M	0.885
Waterplane area coefficient	C _{WP}	0.83
Static load factor	C _A	0.415

PERFORMANCE:

Load condition		LDC	MOC	Cruising
Boat speed, kts	V _S	17.0	24.1	13.3
Boat speed (LDC), m/s		8.74	12.37	6.86
Froude number, F _{NL}		0.96	1.35	0.75
Froude number, F _{NV}		2.04	2.88	1.60
RPM, %		100	100	80
Propulsive efficiency	η	0.55		
K	K	200		
Effective power (EHP), kW	P _E	43		
Power demand (SHP), kW	P _S	78		
Power demand (SHP), h.p.	P _S	106		65
Power margin, %		5		
Derating factor, %		0		
Required power, h.p.		111		68

FUEL CONSUMPTION / RANGE:

Load condition		LDC	MOC	Cruising
Specific fuel consumption, g/h.p./h	q _F	180		
Fuel density, kg/m³	ρ _F	850		
Fuel consumption per nautical mile, L/nM		1.38	0.98	1.08
Range, nM	R	369	522	470

SEAKEEPING:

Deadrise angle at STN5, deg	β _S	7.1		
Vertical accelerations, 1/g	a _{Cg} /g			
Sea states:		LDC	MOC	Cruising
SS2		0.25		0.16
SS3		0.54		0.33
SS4		1.04		0.64
SS5		1.72		1.06

WEIGHTS:

Structure:		
Structural mass factor, kg/m³	m _H	40
Superstructure factor	K _S	1
Mass of structure, kg	M _H	1568
Interior & outfit:		
Interior mass factor, kg/m³	m _I	7
Mass of interior & outfit, kg	M _I	274
Machinery:		
Number of engines	n	1
Engine mass factor	m _E	1.8
Mass of engines	M _E	200
Drive type factor	K _D	1
Machinery mass factor	K _M	1.5
Mass of machinery	M _M	300
Deck equipment:		
Deck equipment mass factor	m _D	0.3
Mass of deck equipment, kg	M _D	150
Systems:		
Systems mass factor	K _{SYS}	0.3
Mass of systems, kg	M _{SYS}	150
Electrical:		
Electrical system mass factor	K _{EL}	0.3
Mass of electrical system, kg	M _{EL}	150
Other:		
Additional equipment	M _A	300
Weight margin	M _M	0
Light craft mass, kg	M _{LCC}	2893
Safety equipment	M _S	56
Non-consumable stores	M _{NCS}	0
Crew at MOC	n _{MOC}	3
Mass of crew at MOC	M _P	360
Minimum operation mass, kg	M _{MOC}	3309
Crew/passengers/personnel:		
Number of crew/passengers/personell, kg	n	3
Mass of one crew/pasenger	m _P	120
Mass of crew/pasengers, kg	M _P	360
Fuel:		
Fuel capacity factor, L/h.p.		2
Fuel tanks capacity (estimated), L		222
Fuel tanks capacity (used), L		600
Mass of fuel, kg	M _F	510
Other liquids:		
Fresh water capacity (used), L	M _F	200
Waste tank capacity (used), L	M _W	60
Other liquids	M _L	0
Cargo	M _{CRG}	3000
Payload	M _{MTL}	4130
Loaded displacement mass, kg	M _{LDC}	7023