Resistance

23 stu 2021 12:38
HydroComp NavCad 2014

Project ID **ZERO**
Description **TWIN PROP**
File name **ZERO 3 2100_fiksni PD 1.hcnc**

Analysis parameters

Vessel drag		**ITTC-78 (CT)**
Technique:	**[Calc]**	**Prediction**
Prediction:		**Holtrop**
Reference ship:		
Model LWL:		
Expansion:		**Standard**
Friction line:		**ITTC-57**
Hull form factor:	**[On]**	**1,345**
Speed corr:	**[On]**	
Spray drag corr:	**[Off]**	
Corr allowance:		**ITTC-78 (v2008)**
Roughness [mm]:	**[Off]**	

Added drag		
Appendage:	**[Calc]**	**Teeters (Sailboat)**
Wind:	**[Calc]**	**Taylor**
Seas:	**[Calc]**	**Workboat**
Shallow/channel:	**[Off]**	
Towed:	**[Off]**	
Margin:	**[Calc]**	**Hull + added drag [4%]**
Water properties		
Water type:		**Salt**
Density:		**1026,00 kg/m3**
Viscosity:		**1,18920e-6 m2/s**

Prediction method check [Holtrop]

Parameters	FN [design]	CP	LWL/BWL	BWL/T	Lambda
Value	**0,23**	**0,64**	**4,77**	**2,61**	**0,78**
Range	**0,06··0,40**	**0,55··0,85**	**3,90··14,90**	**2,10··4,00**	**0,01··1,07**

Prediction results

	SPEED COEFS		ITTC-78 COEFS						
SPEED [kt]	FN	FV	RN	CF	[CV/CF]	CR	dCF	CA	CT
3,00	**0,073**	**0,168**	**5,94e7**	**0,002250**	**1,345**	**0,000002**	**0,000000**	**0,000667**	**0,003695**
3,50	**0,085**	**0,196**	**6,93e7**	**0,002199**	**1,345**	**0,000003**	**0,000000**	**0,000683**	**0,003642**
4,00	**0,097**	**0,224**	**7,92e7**	**0,002156**	**1,345**	**0,000003**	**0,000000**	**0,000695**	**0,003596**
4,50	**0,109**	**0,252**	**8,91e7**	**0,002119**	**1,344**	**0,000005**	**0,000000**	**0,000704**	**0,003556**
5,00	**0,121**	**0,280**	**9,90e7**	**0,002087**	**1,344**	**0,000007**	**0,000000**	**0,000710**	**0,003521**
6,00	**0,146**	**0,335**	**1,19e8**	**0,002032**	**1,342**	**0,000025**	**0,000000**	**0,000719**	**0,003471**
7,00	**0,170**	**0,391**	**1,39e8**	**0,001988**	**1,338**	**0,000083**	**0,000000**	**0,000723**	**0,003467**
8,00	**0,194**	**0,447**	**1,58e8**	**0,001951**	**1,332**	**0,000226**	**0,000000**	**0,000726**	**0,003551**
9,00	**0,219**	**0,503**	**1,78e8**	**0,001920**	**1,322**	**0,000506**	**0,000000**	**0,000726**	**0,003771**
+ 9,50 +	**0,231**	**0,531**	**1,88e8**	**0,001905**	**1,316**	**0,000711**	**0,000000**	**0,000726**	**0,003945**

	RESISTANCE							
SPEED [kt]	RBARE [kN]	RAPP [kN]	RWIND [kN]	RSEAS [kN]	RCHAN [kN]	RTOWED [kN]	RMARGIN [kN]	RTOTAL [kN]
3,00	**2,24**	**0,92**	**0,78**	**0,30**	**0,00**	**0,00**	**0,17**	**4,41**
3,50	**3,01**	**1,23**	**0,87**	**0,34**	**0,00**	**0,00**	**0,22**	**5,67**
4,00	**3,88**	**1,58**	**0,96**	**0,38**	**0,00**	**0,00**	**0,27**	**7,08**
4,50	**4,86**	**1,98**	**1,05**	**0,42**	**0,00**	**0,00**	**0,33**	**8,64**
5,00	**5,94**	**2,41**	**1,15**	**0,45**	**0,00**	**0,00**	**0,40**	**10,36**
6,00	**8,43**	**3,41**	**1,37**	**0,51**	**0,00**	**0,00**	**0,55**	**14,26**
7,00	**11,46**	**4,56**	**1,60**	**0,56**	**0,00**	**0,00**	**0,73**	**18,91**
8,00	**15,33**	**5,87**	**1,85**	**0,59**	**0,00**	**0,00**	**0,95**	**24,59**
9,00	**20,61**	**7,34**	**2,11**	**0,62**	**0,00**	**0,00**	**1,23**	**31,91**
+ 9,50 +	**24,02**	**8,14**	**2,25**	**0,62**	**0,00**	**0,00**	**1,40**	**36,44**

	EFFECTIVE POWER		OTHER		
SPEED [kt]	PEBARE [kW]	PETOTAL [kW]	CTLR	CTLT	RBARE/W
3,00	**3,5**	**6,8**	**0,00004**	**0,06530**	**0,00035**
3,50	**5,4**	**10,2**	**0,00004**	**0,06437**	**0,00047**
4,00	**8,0**	**14,6**	**0,00006**	**0,06356**	**0,00060**
4,50	**11,2**	**20,0**	**0,00008**	**0,06285**	**0,00075**
5,00	**15,3**	**26,6**	**0,00013**	**0,06223**	**0,00092**
6,00	**26,0**	**44,0**	**0,00044**	**0,06135**	**0,00130**
7,00	**41,3**	**68,1**	**0,00147**	**0,06128**	**0,00177**
8,00	**63,1**	**101,2**	**0,00399**	**0,06275**	**0,00237**
9,00	**95,4**	**147,7**	**0,00894**	**0,06664**	**0,00318**
+ 9,50 +	**117,4**	**178,1**	**0,01257**	**0,06972**	**0,00371**

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Project ID **ZERO**
Description **TWIN PROP**
File name **ZERO 3 2100_fiksni PD 1.hcnc**

Hull data

General		
Configuration:		**Monohull**
Chine type:		**Round/multiple**
Length on WL:		**45,750 m**
Max beam on WL:	[LWL/BWL 4,766]	**9,600 m**
Max molded draft:	[BWL/T 2,607]	**3,682 m**
Displacement:	[CB 0,398]	**660,00 t**
Wetted surface:	[CS 2,897]	**497,0 m2**

ITTC-78 (CT)		
LCB fwd TR:	[XCB/LWL 0,494]	**22,593 m**
LCF fwd TR:	[XCF/LWL 0,461]	**21,100 m**
Max section area:	[CX 0,625]	**22,1 m2**
Waterplane area:	[CWP 0,765]	**336,0 m2**
Bulb section area:		**0,0 m2**
Bulb ctr below WL:		**0,000 m**
Bulb nose fwd TR:		**0,000 m**
Imm transom area:	[ATR/AX 0,000]	**0,0 m2**
Transom beam WL:	[BTR/BWL 0,000]	**0,000 m**
Transom immersion:	[TTR/T 0,000]	**0,000 m**
Half entrance angle:		**20,60 deg**
Bow shape factor:	[BTK flow]	**-1,0**
Stern shape factor:	[WL flow]	**1,0**

Planing		
Proj chine length:		***0,000 m***
Proj bottom area:		***0,0 m2***
LCG fwd TR:	*[XCG/LP 0,000]*	***0,000 m***
VCG below WL:		***0,000 m***
Aft station (fwd TR):		***0,000 m***
Deadrise:		***0,00 deg***
Chine beam:		***0,000 m***
Chine ht below WL:		***0,000 m***
Fwd station (fwd TR):		***0,000 m***
Deadrise:		***0,00 deg***
Chine beam:		***0,000 m***
Chine ht below WL:		***0,000 m***
Propulsor type:		***Propeller***
Max prop diameter:		***2300,0 mm***
Shaft angle to WL:		***4,00 deg***
Position fwd TR:		***0,000 m***
Position below WL:		***0,000 m***
Transom lift device:		***Flap***
Device count:		***0***
Span:		***0,000 m***
Chord length:		***0,000 m***
Deflection angle:		***0,00 deg***
Tow point fwd TR:		***0,000 m***
Tow point below WL:		***0,000 m***

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Appendage data

General	
Definition:	**Component**
Percent of hull drag:	**0,00 %**
Planing influence	
LCE fwd TR:	**0,000 m**
VCE below WL:	**0,000 m**
Shafting	
Count:	**2**
Max prop diameter:	**2300,0 mm**
Shaft angle to WL:	**4,00 deg**
Exposed shaft length:	**2,500 m**
Shaft diameter:	**0,200 m**
Wetted surface:	**1,6 m2**
Strut bossing length:	**1,500 m**
Bossing diameter:	**0,450 m**
Wetted surface:	**2,1 m2**
Hull bossing length:	**2,300 m**
Bossing diameter:	**0,400 m**
Wetted surface:	**2,9 m2**
Strut (per shaft line)	
Count:	**1**
Root chord:	**0,650 m**
Tip chord:	**0,500 mm**
Span:	**1,550 m**
T/C ratio:	**0,100**
Projected area:	**0,9 m2**
Wetted surface:	**1,8 m2**
Exposed palm depth:	**0,012 m**
Exposed palm width:	**1,000 m**
Rudder	
Count:	**2**
Rudder location:	**Behind propeller**
Type:	**Balanced foil**
Root chord:	**1,500 m**
Tip chord:	**1,000 m**
Span:	**3,000 m**
T/C ratio:	**0,150**
LE sweep:	**3,00 deg**
Projected area:	**3,8 m2**
Wetted surface:	**7,6 m2**

Skeg/Keel	
Count:	**1**
Type:	**Keel**
Root chord:	**12,900 m**
Tip chord:	**12,400 m**
Span:	**1,400 m**
T/C ratio:	**0,150**
LE sweep:	**95,00 deg**
Keel bulb length:	**0,000 m**
Keel bulb diameter:	**0,000 m**
Projected area:	**17,7 m2**
Wetted surface:	**35,9 m2**
Stabilizer	
Count:	**0**
Root chord:	**0,000 m**
Tip chord:	**0,000 m**
Span:	**0,000 m**
T/C ratio:	**0,000**
LE sweep:	**0,00 deg**
Wetted surface:	**0,0 m2**
Projected area:	**0,0 m2**
Dynamic multiplier:	**1,00**
Bilge keel	
Count:	**2**
Mean length:	**17,000 m**
Mean base width:	**0,300 m**
Mean projection:	**1,000 m**
Wetted surface:	**34,4 m2**
Tunnel thruster	
Count:	**2**
Diameter:	**0,400 m**
Sonar dome	
Count:	**0**
Wetted surface:	**0,0 m2**
Miscellaneous	
Count:	**0**
Drag area:	**0,0 m2**
Drag coef:	**0,00**

Environment data

Wind	
Wind speed:	**8,50 kt**
Angle off bow:	**0,00 deg**
Gradient correction:	**On**
Exposed hull	
Transverse area:	**38,0 m2**
VCE above WL:	**1,800 m**
Profile area:	**150,0 m2**
Superstructure	
Superstructure shape:	**Motor yacht**
Transverse area:	**41,0 m2**
VCE above WL:	**5,100 m**
Profile area:	**94,0 m2**

Seas	
Significant wave ht:	**0,880 m**
Modal wave period:	**7,5 sec**
Shallow/channel	
Water depth:	**0,000 m**
Type:	**Shallow water**
Channel width:	**0,000 m**
Channel side slope:	**0,00 deg**
Hull girth:	**0,000 m**

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Symbols and values

SPEED =	Vessel speed
FN =	Froude number [LWL]
FV =	Froude number [VOL]
RN =	Reynolds number [LWL]
CF =	Frictional resistance coefficient
CV/CF =	Viscous/frictional resistance coefficient ratio [dynamic form factor]
CR =	Residuary resistance coefficient
dCF =	Added frictional resistance coefficient for roughness
CA =	Correlation allowance [dynamic]
CT =	Total bare-hull resistance coefficient
RBARE =	Bare-hull resistance
RAPP =	Additional appendage resistance
RWIND =	Additional wind resistance
RSEAS =	Additional sea-state resistance
RCHAN =	Additional shallow/channel resistance
RTOWED =	Additional towed object resistance
RMARGIN =	Resistance margin
RTOTAL =	Total vessel resistance
PEBARE =	Bare-hull effective power
PETOTAL =	Total effective power
CTLR =	Telfer residuary resistance coefficient
CTLT =	Telfer total bare-hull resistance coefficient
RBARE/W =	Bare-hull resistance to weight ratio
+ =	Design speed indicator
* =	Exceeds parameter limit