Analysis parameters

Bare-hull	**[Calc] CRTS**	Appendage	**[Off]**
Friction line	**ITTC**	Wind	**[Calc] Taylor head wind**
Technique	**Prediction**	Seas	**[Calc] Modified Aertssen**
Align to	**[Off]**	Channel	**[Calc] Schlicting shallow**
Align by	**[Off]**	Misc: Margin	**[Calc] - 4% Hull drag only**
Correlation allowance	**0,0004**	Water type	**Standard Fresh**
Roughness (mm)	**[On] 0,2**	Mass density	**999,01 [kg/m3]**
3D form factor	**[On] 1,2414**	Kinematic viscosity	**1,1390e-06 [m2/s]**
Speed dependent correction	**[On]**		

Prediction results

Vel [kts]	Fn	Rn	Cf	[Cform]	[Cw]	Cr	Ct
5,00	**0,185**	**4,44e+7**	**0,002352**	**0,000543**	**0,000642**	**0,001185**	**0,003937**
7,00	**0,259**	**6,22e+7**	**0,002234**	**0,000461**	**0,001680**	**0,002141**	**0,004775**
9,00	**0,333**	**7,99e+7**	**0,002153**	**0,000327**	**0,003338**	**0,003665**	**0,006218**
10,00	**0,370**	**8,88e+7**	**0,002120**	**0,000246**	**0,005283**	**0,005529**	**0,008049**
11,00	**0,408**	**9,77e+7**	**0,002090**	**0,000182**	**0,008194**	**0,008376**	**0,010866**
12,00	**0,445**	**1,07e+8**	**0,002064**	**0,000146**	**0,011836**	**0,011981**	**0,014446**
13,00	**0,482**	**1,15e+8**	**0,002041**	**0,000120**	**0,014039**	**0,014159**	**0,016599**
14,00	**0,519**	**1,24e+8**	**0,002019**	**0,000096**	**0,014613**	**0,014709**	**0,017128**
15,00	**0,556**	**1,33e+8**	**0,001999**	**0,000072**	**0,014639**	**0,014711**	**0,017110**
16,00	**0,593**	**1,42e+8**	**0,001981**	**0,000051**	**0,013395**	**0,013446**	**0,015827**

Vel [kts]	Rw/W	Rr/W	Rbare/W	Rw [kN]	Rr [kN]	Rbare [kN]	PEbare [kW]
5,00	**0,00036**	**0,00066**	**0,00219**	**0**	**0**	**1**	**3**
7,00	**0,00183**	**0,00233**	**0,00520**	**1**	**1**	**3**	**10**
9,00	**0,00601**	**0,00660**	**0,01120**	**3**	**4**	**6**	**28**
10,00	**0,01175**	**0,01230**	**0,01790**	**6**	**7**	**10**	**50**
11,00	**0,02205**	**0,02254**	**0,02924**	**12**	**12**	**16**	**89**
12,00	**0,03790**	**0,03837**	**0,04626**	**20**	**21**	**25**	**154**
13,00	**0,05276**	**0,05321**	**0,06239**	**28**	**29**	**34**	**224**
14,00	**0,06370**	**0,06411**	**0,07466**	**34**	**34**	**40**	**289**
15,00	**0,07325**	**0,07361**	**0,08562**	**39**	**40**	**46**	**355**
16,00	**0,07626**	**0,07655**	**0,09011**	**41**	**41**	**48**	**399**

Vel [kts]	Rapp [kN]	Rwind [kN]	Rseas [kN]	Rchan [kN]	Rmisc [kN]	Rtotal [kN]	PEtotal [kW]
5,00	**0**	**2**	**0**	**0**	**0**	**3**	**9**
7,00	**0**	**2**	**2**	**0**	**0**	**8**	**28**
9,00	**0**	**3**	**7**	**0**	**0**	**16**	**74**
10,00	**0**	**3**	**12**	**0**	**0**	**25**	**130**
11,00	**0**	**3**	**21**	**0**	**1**	**41**	**231**
12,00	**0**	**4**	**35**	**0**	**1**	**64**	**398**
13,00	**0**	**4**	**47**	**1**	**1**	**87**	**583**
14,00	**0**	**4**	**57**	**2**	**2**	**105**	**757**
15,00	**0**	**4**	**66**	**4**	**2**	**122**	**942**
16,00	**0**	**5**	**69**	**6**	**2**	**131**	**1076**

Hull data

General:	
Length between PP	**19,912 [m]**
WL bow pt aft FP	**0,000 [m]**
Length on WL	**19,662 [m]**
Max beam on WL	**5,128 [m]**
Max molded draft	**1,250 [m]**
Displacement bare	**54,85 [t]**
Wetted surface	**90,488 [m2]**
Chine type	**Round bilge**
Parameters:	
Lwl/B	**3,8342**
B/T	**4,1024**
Cb	**0,4356**
Cws	**2,7541**

Ct-based:	
Max section area	**4,646 [m2]**
Waterplane area	**69,861 [m2]**
Trim by stern	**0,150 [m]**
LCB aft of FP	**11,385 [m]**
Bulb ext fwd FP	**0,067 [m]**
Bulb area at FP	**0,018 [m2]**
Bulb ctr above BL	**0,899 [m]**
Transom area	**1,140 [m2]**
Transom beam	**4,260 [m]**
Transom draft	**0,290 [m]**
Half ent angle	**14,1 [deg]**
Bow shape	**Buttock flow [V-shape]**
Stern shape	**WL flow [U-shape]**
Cx	**0,7248**
Cw	**0,6929**
LCB/Lpp	**0,5718**
At/Ax	**0,2454**
Bt/Bx	**0,8307**
Tt/T	**0,2320**

Parameters:	**CRTS**	
Fn(Lwl)	0,178...0,684	0,19
Fn-high	0,178...0,684	0,59
Cvol(Lwl)	4,85...11,27	5,17
Bwl/T	2,2...5,2	4,10
Cp(Lwl)	0,52...0,7	0,60
Ie	2...20	14,1
Cx	0,64...1	0,72
At/Ax	0...0,4	0,25
Bt/Bwl	0...0,85	0,83
Tt/T	0...0,42	0,23
Abulb/Ax	0...0,1	0,00

Appendages

Wetted areas (ex. thruster):		**[Drag coefficient]**
Rudders	**0,000 [m2]**	**[0,000]**
Shaft brackets	**0,000 [m2]**	**[0,000]**
Skeg	**0,000 [m2]**	**[0,000]**
Strut bossing	**0,000 [m2]**	**[0,000]**
Hull bossing	**0,000 [m2]**	**[0,000]**
Exposed shafts	**0,000 [m2]**	**[0,000]**
Stablizer fins	**0,000 [m2]**	**[0,000]**
Dome	**0,000 [m2]**	**[0,000]**
Bilge keel	**0,000 [m2]**	**[0,000]**
Bow thruster diam	**0,000 [m]**	**[0,000]**

Sea Tech
Monohull/Resistance
Calculation by NA Razmik Baharyan

20 .03. 2019 12:53
Project: B20-R-Resistance by NavCad-20032019.nc5

Environment data

Wind:		**Seas:**	
Wind speed	**26,05 [kts]**	Sig. wave height	**3,500 [m]**
Angle off bow	**0,000 [deg]**	Modal wave period	**7,7 [sec]**
Tran hull area	**9,150 [m2]**		
VCE above WL	**0,860 [m2]**	**Channel:**	
Tran superst area	**12,570 [m2]**	Channel width	**0,000 [m]**
VCE above WL	**3,090 [m]**	Channel depth	**10,000 [m]**
Total Longl area	**62,950 [m2]**	Side slope	**0,000 [deg]**
VCE above WL	**1,880 [m]**	Wetted hull girth	**7,630 [m]**
Wind speed	**Free stream**		
Arrangement	**Passenger**		

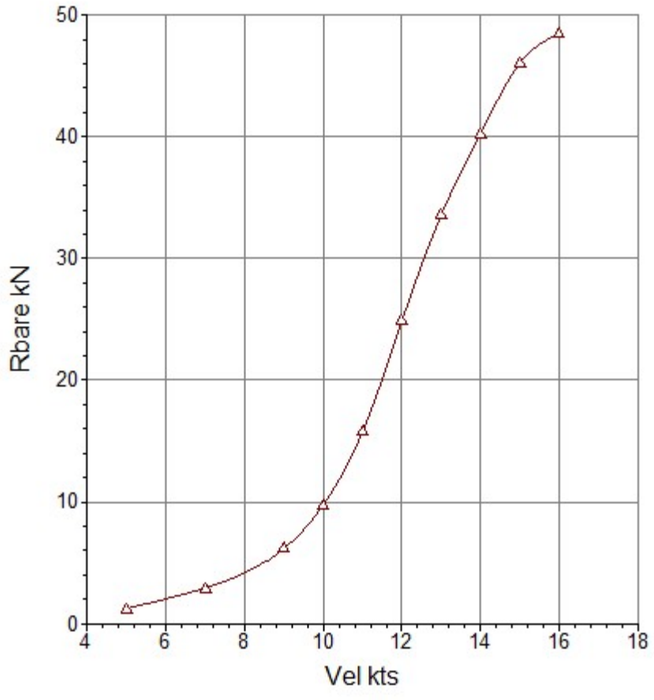
Symbols and values

Fn = Length Froude number
Rn = Reynolds number
Cf = Frictional resistance coefficient
[Cform] = Viscous form resistance coefficient
[Cw] = Wave-making resistance coefficient
Cr = Residuary resistance coefficient
Ct = Total bare-hull resistance coefficient

Rw/W = Wave-making resistance-weight merit ratio
Rr/W = Residuary resistance-weight merit ratio
Rbare/W = Bare-hull resistance-weight merit ratio
Rw = Wave-making resistance component
Rr = Residuary resistance component
Rbare = Bare-hull resistance
PEbare = Bare-hull effective power

Rapp = Additional appendage resistance
Rwind = Additional wind resistance
Rseas = Additional sea-state resistance
Rchan = Additional channel resistance
Rmisc = Miscellaneous resistance
Rtotal = Total vessel resistance
PEtotal = Total effective power

* = Exceeds speed parameter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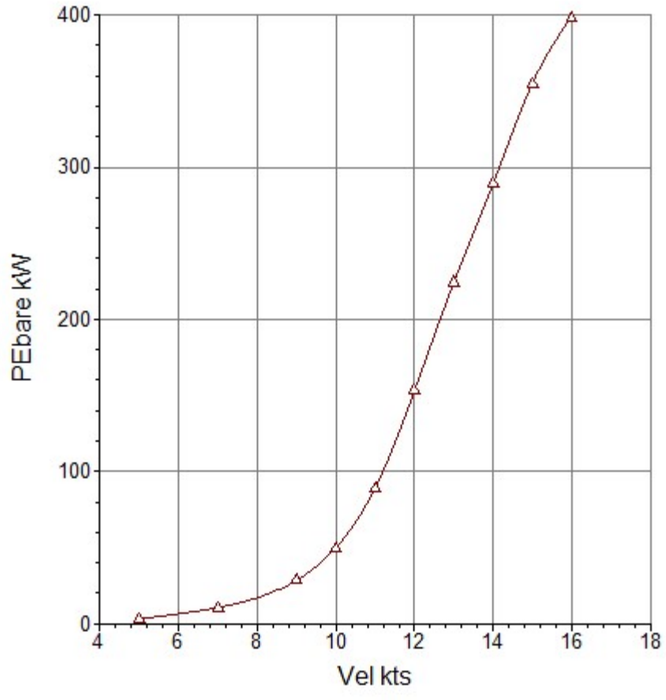
Vel kts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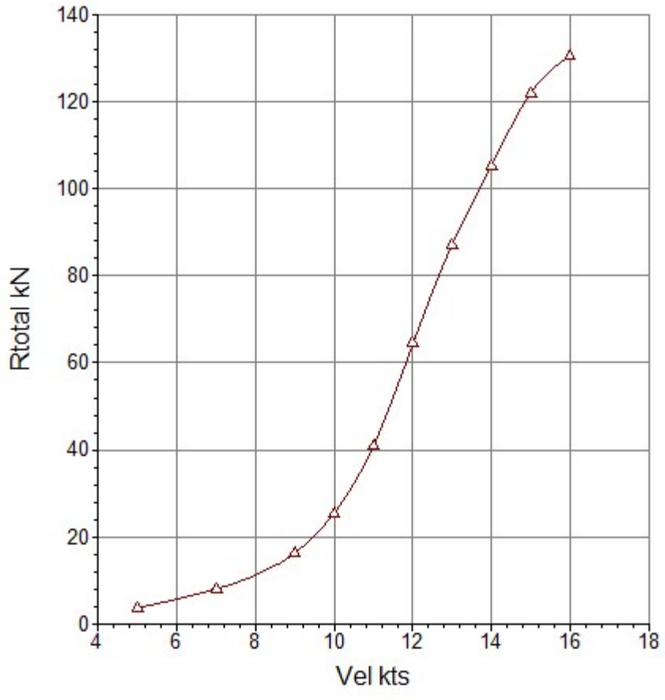
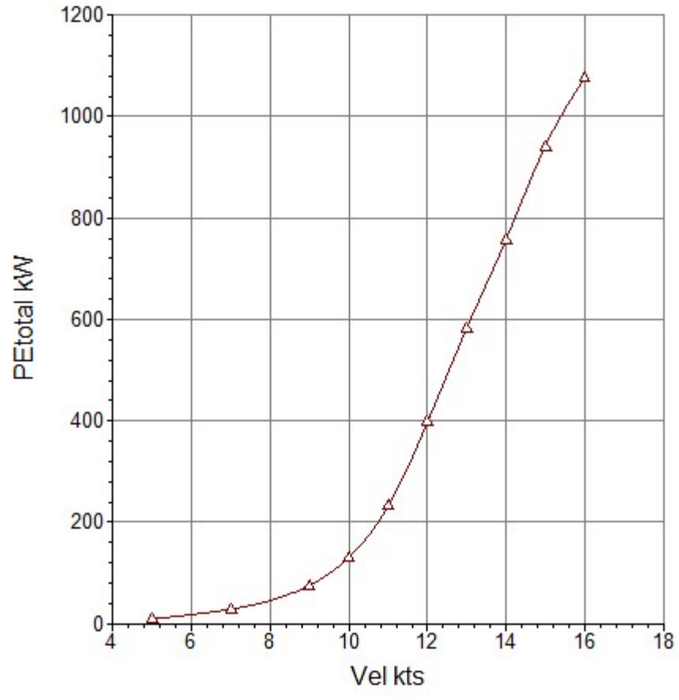
6
8
10
12
14
16
18
Vel kts





Analysis parameters

Bare-hull	**[Calc] DeGroot RB**	Appendage	**[Off]**
Friction line	**ATTC**	Wind	**[Calc] Taylor head wind**
Technique	**Prediction**	Seas	**[Calc] Modified Aertssen**
Align to	**[Off]**	Channel	**[Calc] Schlicting shallow**
Align by	**[Off]**	Misc: Margin	**[Calc] - 4% Hull drag only**
Correlation allowance	**0,0004**	Water type	**Standard Fresh**
Roughness (mm)	**[On] 0,2**	Mass density	**999,01 [kg/m3]**
3D form factor	**[Off] 1,2414**	Kinematic viscosity	**1,1390e-06 [m2/s]**
Speed dependent correction	**[On]**		

Prediction results

Vel [kts]	Fn	Rn	Cf	[Cform]	[Cw]	Cr	Ct
9,00	**0,333**	**7,99e+7**	**0,002139**	**0,000000**	**0,000000**	**0,003025**	**0,005564**
10,00	**0,370**	**8,88e+7**	**0,002107**	**0,000000**	**0,000000**	**0,005521**	**0,008028**
11,00	**0,408**	**9,77e+7**	**0,002079**	**0,000000**	**0,000000**	**0,009329**	**0,011808**
12,00	**0,445**	**1,07e+8**	**0,002054**	**0,000000**	**0,000000**	**0,013090**	**0,015544**
13,00	**0,482**	**1,15e+8**	**0,002031**	**0,000000**	**0,000000**	**0,015992**	**0,018423**
14,00	**0,519**	**1,24e+8**	**0,002010**	**0,000000**	**0,000000**	**0,017524**	**0,019934**
15,00	**0,556**	**1,33e+8**	**0,001991**	**0,000000**	**0,000000**	**0,017292**	**0,019683**
16,00	**0,593**	**1,42e+8**	**0,001973**	**0,000000**	**0,000000**	**0,016077**	**0,018450**

Vel [kts]	Rw/W	Rr/W	Rbare/W	Rw [kN]	Rr [kN]	Rbare [kN]	PEbare [kW]
9,00	**0,00000**	**0,00545**	**0,01002**	**0**	**3**	**5**	**25**
10,00	**0,00000**	**0,01228**	**0,01785**	**0**	**7**	**10**	**49**
11,00	**0,00000**	**0,02510**	**0,03177**	**0**	**14**	**17**	**97**
12,00	**0,00000**	**0,04192**	**0,04978**	**0**	**23**	**27**	**165**
13,00	**0,00000**	**0,06010**	**0,06924**	**0**	**32**	**37**	**249**
14,00	**0,00000**	**0,07638**	**0,08689**	**0**	**41**	**47**	**337**
15,00	**0,00000**	**0,08652**	**0,09849**	**0**	**47**	**53**	**409**
16,00	**0,00000**	**0,09153**	**0,10504**	**0**	**49**	**57**	**465**

Vel [kts]	Rapp [kN]	Rwind [kN]	Rseas [kN]	Rchan [kN]	Rmisc [kN]	Rtotal [kN]	PEtotal [kW]
9,00	**0**	**3**	**6**	**0**	**0**	**14**	**66**
10,00	**0**	**3**	**12**	**0**	**0**	**25**	**129**
11,00	**0**	**3**	**23**	**0**	**1**	**44**	**251**
12,00	**0**	**4**	**37**	**0**	**1**	**69**	**428**
13,00	**0**	**4**	**53**	**1**	**1**	**97**	**646**
14,00	**0**	**4**	**67**	**3**	**2**	**122**	**881**
15,00	**0**	**4**	**76**	**5**	**2**	**140**	**1083**
16,00	**0**	**5**	**81**	**8**	**2**	**152**	**1254**

Hull data

General:

Length between PP	**19,912 [m]**
WL bow pt aft FP	**0,000 [m]**
Length on WL	**19,662 [m]**
Max beam on WL	**5,128 [m]**
Max molded draft	**1,250 [m]**
Displacement bare	**54,85 [t]**
Wetted surface	**90,488 [m2]**
Chine type	**Round bilge**

Parameters:

Lwl/B	**3,8342**
B/T	**4,1024**
Cb	**0,4356**
Cws	**2,7541**

Ct-based:

Max section area	**4,646 [m2]**
Waterplane area	**69,861 [m2]**
Trim by stern	**0,150 [m]**
LCB aft of FP	**11,385 [m]**
Bulb ext fwd FP	**0,067 [m]**
Bulb area at FP	**0,018 [m2]**
Bulb ctr above BL	**0,899 [m]**
Transom area	**1,140 [m2]**
Transom beam	**4,260 [m]**
Transom draft	**0,290 [m]**
Half ent angle	**14,1 [deg]**
Bow shape	**Buttock flow [V-shape]**
Stern shape	**WL flow [U-shape]**
Cx	**0,7248**

Cw	**0,6929**
LCB/Lpp	**0,5718**
At/Ax	**0,2454**
Bt/Bx	**0,8307**
Tt/T	**0,2320**

Parameters:	**DeGroot RB**	
Fn(Lwl)	0,3...1.05	0,33
Fn-high	0,3...1.05	0,59
Cvol(Lwl)	4,67...8,96	5,17
Lwl/Bwl	3,53...10,1	3,83
Bwl/T	2,72...6,58	4,10
Cx	0,56...0,89	0,72
At/Ax	0...0,3	0,25

Appendages

Wetted areas (ex. thruster):		**[Drag coefficient]**
Rudders	**0,000 [m2]**	**[0,000]**
Shaft brackets	**0,000 [m2]**	**[0,000]**
Skeg	**0,000 [m2]**	**[0,000]**
Strut bossing	**0,000 [m2]**	**[0,000]**
Hull bossing	**0,000 [m2]**	**[0,000]**
Exposed shafts	**0,000 [m2]**	**[0,000]**
Stablizer fins	**0,000 [m2]**	**[0,000]**
Dome	**0,000 [m2]**	**[0,000]**
Bilge keel	**0,000 [m2]**	**[0,000]**
Bow thruster diam	**0,000 [m]**	**[0,000]**

Environment data

Wind:	
Wind speed	**26,05 [kts]**
Angle off bow	**0,000 [deg]**
Tran hull area	**9,150 [m2]**
VCE above WL	**0,860 [m2]**
Tran superst area	**12,570 [m2]**
VCE above WL	**3,090 [m]**
Total Longl area	**62,950 [m2]**
VCE above WL	**1,880 [m]**
Wind speed	**Free stream**
Arrangement	**Passenger**

Seas:	
Sig. wave height	**3,500 [m]**
Modal wave period	**7,7 [sec]**
Channel:	
Channel width	**0,000 [m]**
Channel depth	**10,000 [m]**
Side slope	**0,000 [deg]**
Wetted hull girth	**7,630 [m]**

Symbols and values

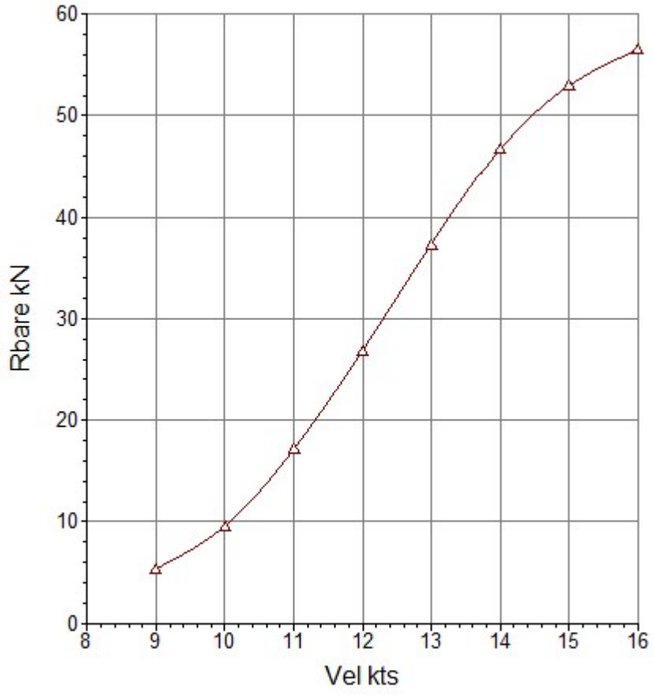
Fn = Length Froude number
Rn = Reynolds number
Cf = Frictional resistance coefficient
[Cform] = Viscous form resistance coefficient

[Cw] = Wave-making resistance coefficient
Cr = Residuary resistance coefficient
Ct = Total bare-hull resistance coefficient

Rw/W = Wave-making resistance-weight merit ratio
Rr/W = Residuary resistance-weight merit ratio
Rbare/W = Bare-hull resistance-weight merit ratio
Rw = Wave-making resistance component
Rr = Residuary resistance component
Rbare = Bare-hull resistance
PEbare = Bare-hull effective power

Rapp = Additional appendage resistance
Rwind = Additional wind resistance
Rseas = Additional sea-state resistance
Rchan = Additional channel resistance
Rmisc = Miscellaneous resistance
Rtotal = Total vessel resistance
PEtotal = Total effective power

* = Exceeds speed parameter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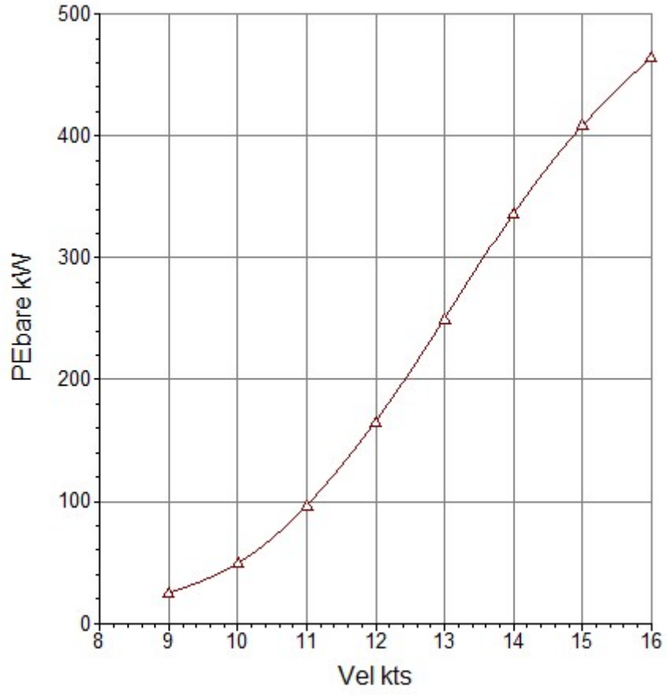
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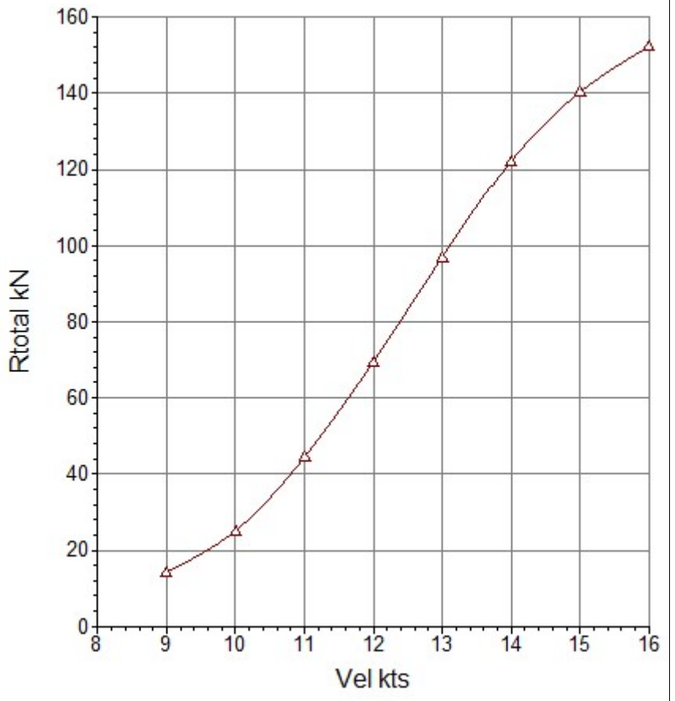
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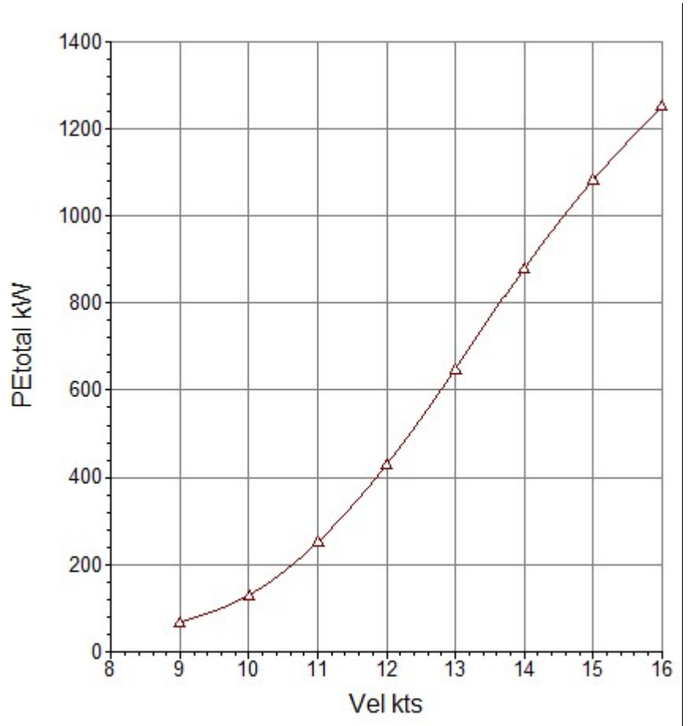


Sea Tech
Monohull/Resistance
Calculation by NA Razmik Baharyan

20 .03. 2019 12:23
Project: B20-R-Resistance by NavCad-20032019.nc5

Analysis parameters

Bare-hull	**[Calc] Holtrop 1984**	Appendage	**[Off]**
Friction line	**ITTC**	Wind	**[Calc] Taylor head wind**
Technique	**Prediction**	Seas	**[Calc] Modified Aertssen**
Align to	**[Off]**	Channel	**[Calc] Schlicting shallow**
Align by	**[Off]**	Misc: Margin	**[Calc] - 4% Hull drag only**
Correlation allowance	**0,00054**	Water type	**Standard Fresh**
Roughness (mm)	**[On] 0,2**	Mass density	**999,01 [kg/m3]**
3D form factor	**[On] 1,3522**	Kinematic viscosity	**1,1390e-06 [m2/s]**
Speed dependent correction	**[On]**		

Prediction results

Vel [kts]	Fn	Rn	Cf	[Cform]	[Cw]	Cr	Ct
5,00	**0,185**	**4,44e+7**	**0,002352**	**0,000793**	**0,001930**	**0,002723**	**0,005614**
7,00	**0,259**	**6,22e+7**	**0,002234**	**0,000673**	**0,002187**	**0,002860**	**0,005635**

9,00	**0,333**	**7,99e+7**	**0,002153**	**0,000477**	**0,003294**	**0,003771**	**0,006463**
10,00	**0,370**	**8,88e+7**	**0,002120**	**0,000359**	**0,004193**	**0,004552**	**0,007212**
11,00	**0,408**	**9,77e+7**	**0,002090**	**0,000265**	**0,006312**	**0,006577**	**0,009207**
12,00	**0,445**	**1,07e+8**	**0,002064**	**0,000212**	**0,008510**	**0,008722**	**0,011327**
13,00	**0,482**	**1,15e+8**	**0,002041**	**0,000175**	**0,010131**	**0,010306**	**0,012887**
14,00	**0,519**	**1,24e+8**	**0,002019**	**0,000140**	**0,010985**	**0,011124**	**0,013683**
15,00	**0,556**	**1,33e+8**	**0,001999**	**0,000105**	**0,011004**	**0,011109**	**0,013649**
16,00	**0,593**	**1,42e+8**	**0,001981**	**0,000075**	**0,010497**	**0,010572**	**0,013093**

Vel [kts]	Rw/W	Rr/W	Rbare/W	Rw [kN]	Rr [kN]	Rbare [kN]	PEbare [kW]
5,00	**0,00107**	**0,00151**	**0,00312**	**1**	**1**	**2**	**4**
7,00	**0,00238**	**0,00312**	**0,00614**	**1**	**2**	**3**	**12**
9,00	**0,00593**	**0,00679**	**0,01164**	**3**	**4**	**6**	**29**
10,00	**0,00933**	**0,01012**	**0,01604**	**5**	**5**	**9**	**44**
11,00	**0,01698**	**0,01770**	**0,02478**	**9**	**10**	**13**	**75**
12,00	**0,02725**	**0,02793**	**0,03627**	**15**	**15**	**20**	**120**
13,00	**0,03808**	**0,03873**	**0,04843**	**20**	**21**	**26**	**174**
14,00	**0,04788**	**0,04849**	**0,05964**	**26**	**26**	**32**	**231**
15,00	**0,05506**	**0,05559**	**0,06830**	**30**	**30**	**37**	**283**
16,00	**0,05976**	**0,06019**	**0,07454**	**32**	**32**	**40**	**330**

Vel [kts]	Rapp [kN]	Rwind [kN]	Rseas [kN]	Rchan [kN]	Rmisc [kN]	Rtotal [kN]	PEtotal [kW]
5,00	**0**	**2**	**1**	**0**	**0**	**5**	**12**
7,00	**0**	**2**	**3**	**0**	**0**	**9**	**32**
9,00	**0**	**3**	**7**	**0**	**0**	**17**	**77**
10,00	**0**	**3**	**11**	**0**	**0**	**23**	**117**
11,00	**0**	**3**	**17**	**0**	**1**	**35**	**196**
12,00	**0**	**4**	**27**	**0**	**1**	**51**	**313**
13,00	**0**	**4**	**36**	**1**	**1**	**68**	**454**
14,00	**0**	**4**	**45**	**2**	**1**	**84**	**606**
15,00	**0**	**4**	**52**	**3**	**1**	**97**	**752**
16,00	**0**	**5**	**57**	**5**	**2**	**108**	**890**

Hull data

General:

Length between PP	**19,912 [m]**
WL bow pt aft FP	**0,000 [m]**
Length on WL	**19,662 [m]**
Max beam on WL	**5,128 [m]**
Max molded draft	**1,250 [m]**
Displacement bare	**54,85 [t]**
Wetted surface	**90,488 [m2]**
Chine type	**Round bilge**

Parameters:

Lwl/B	**3,8342**
B/T	**4,1024**
Cb	**0,4356**
Cws	**2,7541**

Ct-based:

Max section area	**4,646 [m2]**
Waterplane area	**69,861 [m2]**
Trim by stern	**0,150 [m]**
LCB aft of FP	**11,385 [m]**
Bulb ext fwd FP	**0,067 [m]**
Bulb area at FP	**0,018 [m2]**
Bulb ctr above BL	**0,899 [m]**
Transom area	**1,140 [m2]**
Transom beam	**4,260 [m]**
Transom draft	**0,290 [m]**
Half ent angle	**14,1 [deg]**
Bow shape	**Buttock flow [V-shape]**
Stern shape	**WL flow [U-shape]**

Cx	**0,7248**
Cw	**0,6929**
LCB/Lpp	**0,5718**
At/Ax	**0,2454**
Bt/Bx	**0,8307**
Tt/T	**0,2320**

Parameters:	**Holtrop 1984**		
Fn(Lwl)	0,1...0,8	0,19	
Fn-high	0,1...0,8	0,59	
Lwl/Bwl	3,9...14,9	3,83	Limit
Bwl/T	2,1...4	4,10	Limit
Cp(Lwl)	0,55...0,85	0,60	
Lambda	0...0,76	0,75	

Appendages

Wetted areas (ex. thruster):		**[Drag coefficient]**
Rudders	**0,000 [m2]**	**[0,000]**
Shaft brackets	**0,000 [m2]**	**[0,000]**
Skeg	**0,000 [m2]**	**[0,000]**
Strut bossing	**0,000 [m2]**	**[0,000]**
Hull bossing	**0,000 [m2]**	**[0,000]**
Exposed shafts	**0,000 [m2]**	**[0,000]**
Stablizer fins	**0,000 [m2]**	**[0,000]**
Dome	**0,000 [m2]**	**[0,000]**
Bilge keel	**0,000 [m2]**	**[0,000]**
Bow thruster diam	**0,000 [m]**	**[0,000]**

Environment data

Wind:	
Wind speed	**26,05 [kts]**
Angle off bow	**0,000 [deg]**
Tran hull area	**9,150 [m2]**
VCE above WL	**0,860 [m2]**
Tran superst area	**12,570 [m2]**
VCE above WL	**3,090 [m]**
Total Longl area	**62,950 [m2]**
VCE above WL	**1,880 [m]**
Wind speed	**Free stream**
Arrangement	**Passenger**

Seas:	
Sig. wave height	**3,500 [m]**
Modal wave period	**7,7 [sec]**
Channel:	
Channel width	**0,000 [m]**
Channel depth	**10,000 [m]**
Side slope	**0,000 [deg]**
Wetted hull girth	**7,630 [m]**

Symbols and values

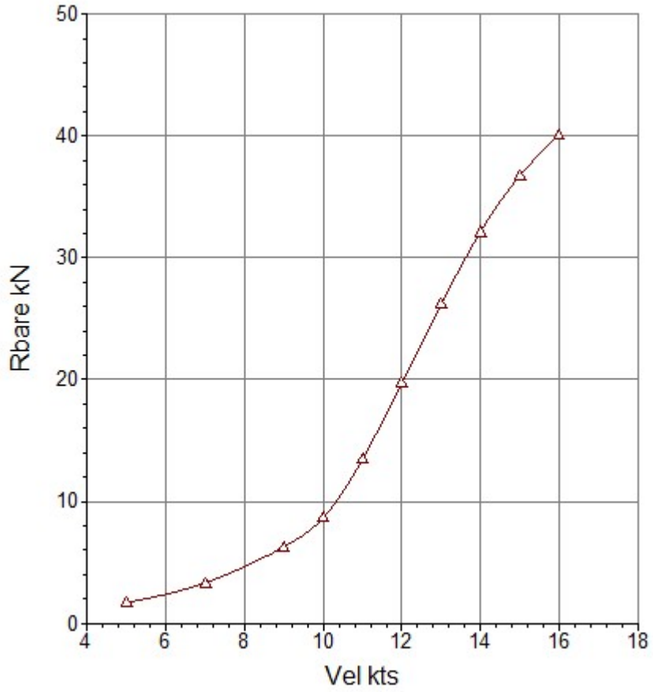
Fn = Length Froude number
Rn = Reynolds number
Cf = Frictional resistance coefficient
[Cform] = Viscous form resistance coefficient

[Cw] = Wave-making resistance coefficient
Cr = Residuary resistance coefficient
Ct = Total bare-hull resistance coefficient

Rw/W = Wave-making resistance-weight merit ratio
Rr/W = Residuary resistance-weight merit ratio
Rbare/W = Bare-hull resistance-weight merit ratio
Rw = Wave-making resistance component
Rr = Residuary resistance component
Rbare = Bare-hull resistance
PEbare = Bare-hull effective power

Rapp = Additional appendage resistance
Rwind = Additional wind resistance
Rseas = Additional sea-state resistance
Rchan = Additional channel resistance
Rmisc = Miscellaneous resistance
Rtotal = Total vessel resistance
PEtotal = Total effective power

* = Exceeds speed parameter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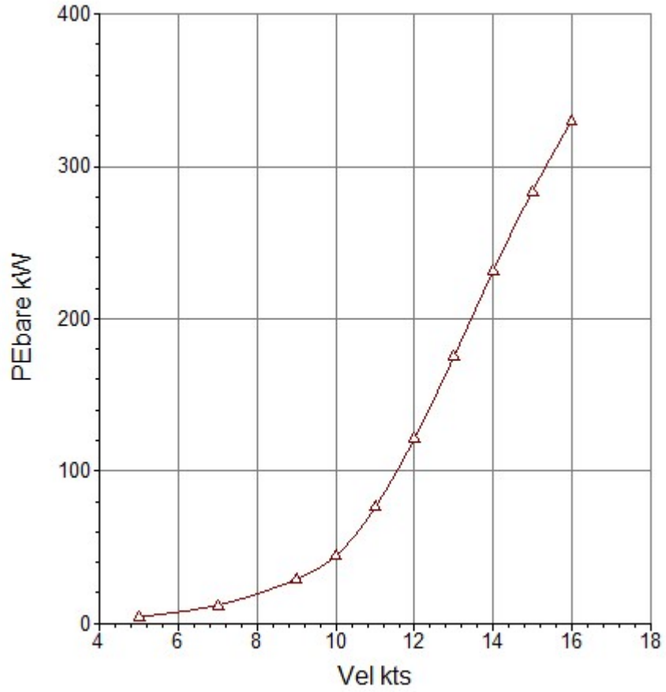
Vel kts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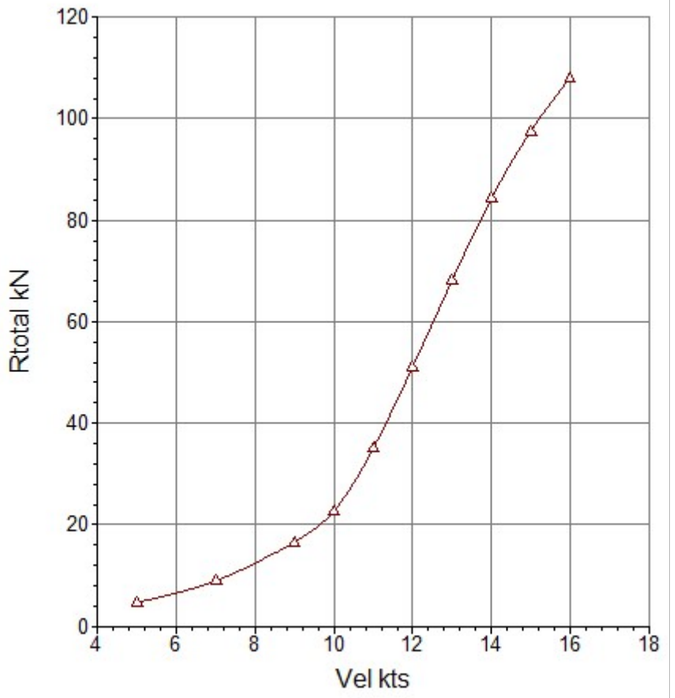
Vel kts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16
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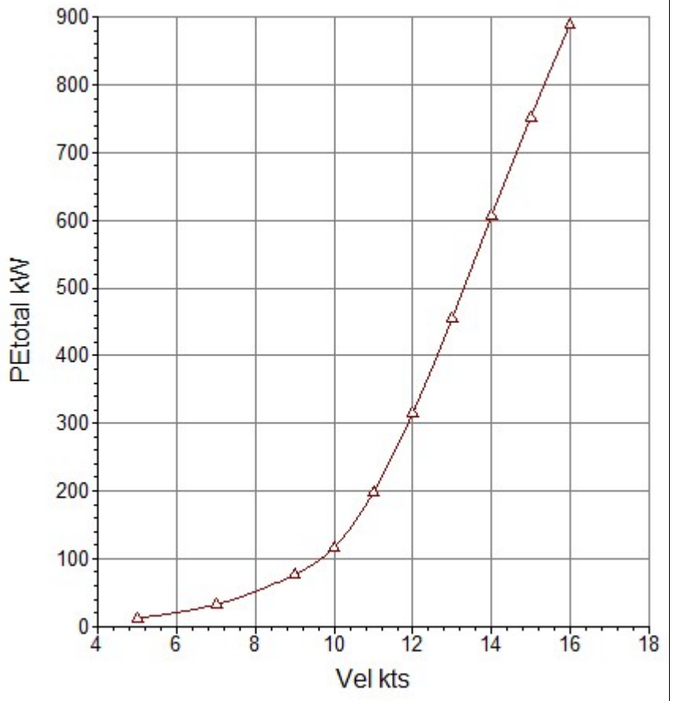
Vel kts



Sea Tech
Monohull/Resistance
Calculation by NA Razmik Baharyan

20 .03. 2019 01:23
Project: B20-R-Resistance by NavCad-20032019.nc5

Analysis parameters

Bare-hull	**[Calc] HSTS**	Appendage	**[Off]**
Friction line	**ITTC**	Wind	**[Calc] Taylor head wind**
Technique	**Prediction**	Seas	**[Calc] Modified Aertssen**
Align to	**[Off]**	Channel	**[Calc] Schlicting shallow**
Align by	**[Off]**	Misc: Margin	**[Calc] - 4% Hull drag only**
Correlation allowance	**0,0004**	Water type	**Standard Fresh**
Roughness (mm)	**[On] 0,2**	Mass density	**999,01 [kg/m3]**
3D form factor	**[On] 1,2414**	Kinematic viscosity	**1,1390e-06 [m2/s]**
Speed dependent correction	**[On]**		

Prediction results

Vel [kts]	Fn	Rn	Cf	[Cform]	[Cw]	Cr	Ct
5,00	**0,185**	**4,44e+7**	**0,002352**	**0,000543**	**0,001159**	**0,001702**	**0,004454**
7,00	**0,259**	**6,22e+7**	**0,002234**	**0,000461**	**0,002744**	**0,003205**	**0,005839**
9,00	**0,333**	**7,99e+7**	**0,002153**	**0,000327**	**0,004430**	**0,004757**	**0,007310**
10,00	**0,370**	**8,88e+7**	**0,002120**	**0,000246**	**0,005434**	**0,005680**	**0,008200**
11,00	**0,408**	**9,77e+7**	**0,002090**	**0,000182**	**0,007907**	**0,008089**	**0,010579**

12,00	**0,445**	**1,07e+8**	**0,002064**	**0,000146**	**0,011691**	**0,011836**	**0,014301**
13,00	**0,482**	**1,15e+8**	**0,002041**	**0,000120**	**0,014850**	**0,014970**	**0,017411**
14,00	**0,519**	**1,24e+8**	**0,002019**	**0,000096**	**0,015909**	**0,016005**	**0,018424**
15,00	**0,556**	**1,33e+8**	**0,001999**	**0,000072**	**0,015216**	**0,015289**	**0,017688**
16,00	**0,593**	**1,42e+8**	**0,001981**	**0,000051**	**0,013778**	**0,013829**	**0,016211**

Vel [kts]	Rw/W	Rr/W	Rbare/W	Rw [kN]	Rr [kN]	Rbare [kN]	PEbare [kW]
5,00	**0,00064**	**0,00095**	**0,00248**	**0**	**1**	**1**	**3**
7,00	**0,00299**	**0,00349**	**0,00636**	**2**	**2**	**3**	**12**
9,00	**0,00798**	**0,00857**	**0,01317**	**4**	**5**	**7**	**33**
10,00	**0,01208**	**0,01263**	**0,01824**	**7**	**7**	**10**	**50**
11,00	**0,02128**	**0,02177**	**0,02847**	**11**	**12**	**15**	**87**
12,00	**0,03744**	**0,03790**	**0,04580**	**20**	**20**	**25**	**152**
13,00	**0,05581**	**0,05626**	**0,06544**	**30**	**30**	**35**	**235**
14,00	**0,06935**	**0,06976**	**0,08031**	**37**	**38**	**43**	**311**
15,00	**0,07614**	**0,07650**	**0,08851**	**41**	**41**	**48**	**367**
16,00	**0,07844**	**0,07873**	**0,09229**	**42**	**42**	**50**	**409**

Vel [kts]	Rapp [kN]	Rwind [kN]	Rseas [kN]	Rchan [kN]	Rmisc [kN]	Rtotal [kN]	PEtotal [kW]
5,00	**0**	**2**	**0**	**0**	**0**	**4**	**10**
7,00	**0**	**2**	**3**	**0**	**0**	**9**	**33**
9,00	**0**	**3**	**8**	**0**	**0**	**19**	**86**
10,00	**0**	**3**	**12**	**0**	**0**	**26**	**132**
11,00	**0**	**3**	**20**	**0**	**1**	**40**	**225**
12,00	**0**	**4**	**34**	**0**	**1**	**64**	**394**
13,00	**0**	**4**	**50**	**1**	**1**	**91**	**611**
14,00	**0**	**4**	**62**	**2**	**2**	**113**	**814**
15,00	**0**	**4**	**68**	**4**	**2**	**126**	**974**
16,00	**0**	**5**	**71**	**7**	**2**	**134**	**1102**

Hull data

General:

Length between PP	**19,912 [m]**
WL bow pt aft FP	**0,000 [m]**
Length on WL	**19,662 [m]**
Max beam on WL	**5,128 [m]**
Max molded draft	**1,250 [m]**
Displacement bare	**54,85 [t]**
Wetted surface	**90,488 [m2]**
Chine type	**Round bilge**

Parameters:

Lwl/B	**3,8342**
B/T	**4,1024**
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Cws	**2,7541**

Ct-based:

Max section area	**4,646 [m2]**
Waterplane area	**69,861 [m2]**
Trim by stern	**0,150 [m]**
LCB aft of FP	**11,385 [m]**
Bulb ext fwd FP	**0,067 [m]**
Bulb area at FP	**0,018 [m2]**
Bulb ctr above BL	**0,899 [m]**
Transom area	**1,140 [m2]**
Transom beam	**4,260 [m]**
Transom draft	**0,290 [m]**
Half ent angle	**14,1 [deg]**
Bow shape	**Buttock flow [V-shape]**
Stern shape	**WL flow [U-shape]**
Cx	**0,7248**
Cw	**0,6929**
LCB/Lpp	**0,5718**

At/Ax	**0,2454**
Bt/Bx	**0,8307**
Tt/T	**0,2320**

Parameters:	**HSTS**			
Fn(Lwl)	0,15...0,90	0,19		
Fn-high	0,15...0,90	0,59		
Cvol(Lwl)	4,73...10,6	5,17		
Lwl/Bwl	3,4...12,1	3,83		
Bwl/T	2,1...6,9	4,10		
Cp(Lwl)	0,55...0,72	0,60		
Ie	3,7...26	14,1		
LCB(Lwl)	-6...1 (%Lwl)	-7,90	Limit	
Cx	0,59...0,98	0,72		
At/Ax	0...0,54	0,25		
Bt/Bwl	0,17...0,95	0,83		
Tt/T	0,05...0,59	0,23		

Appendages

Wetted areas (ex. thruster):		**[Drag coefficient]**
Rudders	**0,000 [m2]**	**[0,000]**
Shaft brackets	**0,000 [m2]**	**[0,000]**
Skeg	**0,000 [m2]**	**[0,000]**
Strut bossing	**0,000 [m2]**	**[0,000]**
Hull bossing	**0,000 [m2]**	**[0,000]**
Exposed shafts	**0,000 [m2]**	**[0,000]**
Stablizer fins	**0,000 [m2]**	**[0,000]**
Dome	**0,000 [m2]**	**[0,000]**
Bilge keel	**0,000 [m2]**	**[0,000]**
Bow thruster diam	**0,000 [m]**	**[0,000]**

Environment data

Wind:		**Seas:**	
Wind speed	**26,05 [kts]**	Sig. wave height	**3,500 [m]**
Angle off bow	**0,000 [deg]**	Modal wave period	**7,7 [sec]**
Tran hull area	**9,150 [m2]**		
VCE above WL	**0,860 [m2]**	**Channel:**	
Tran superst area	**12,570 [m2]**	Channel width	**0,000 [m]**
VCE above WL	**3,090 [m]**	Channel depth	**10,000 [m]**
Total Longl area	**62,950 [m2]**	Side slope	**0,000 [deg]**
VCE above WL	**1,880 [m]**	Wetted hull girth	**7,630 [m]**
Wind speed	**Free stream**		
Arrangement	**Passenger**		

Symbols and values

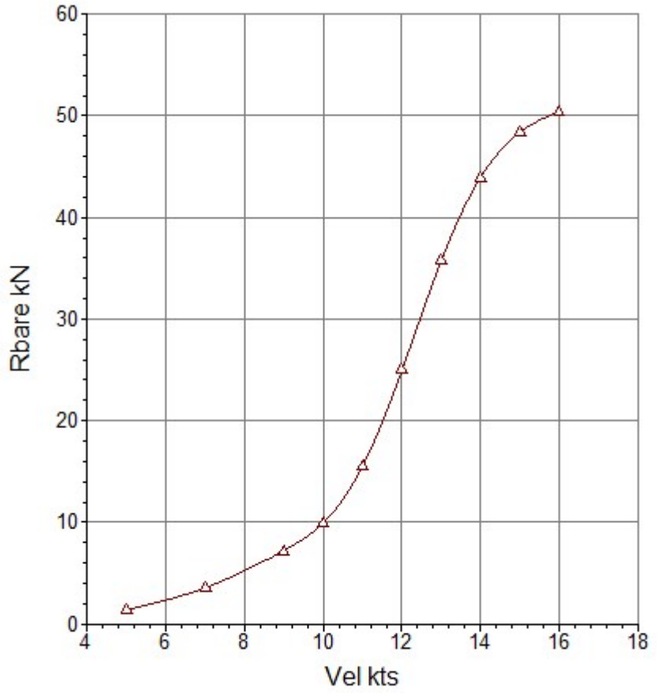
Fn = Length Froude number

Rn = Reynolds number
Cf = Frictional resistance coefficient
[Cform] = Viscous form resistance coefficient
[Cw] = Wave-making resistance coefficient
Cr = Residuary resistance coefficient
Ct = Total bare-hull resistance coefficient

Rw/W = Wave-making resistance-weight merit ratio
Rr/W = Residuary resistance-weight merit ratio
Rbare/W = Bare-hull resistance-weight merit ratio
Rw = Wave-making resistance component
Rr = Residuary resistance component
Rbare = Bare-hull resistance
PEbare = Bare-hull effective power

Rapp = Additional appendage resistance
Rwind = Additional wind resistance
Rseas = Additional sea-state resistance
Rchan = Additional channel resistance
Rmisc = Miscellaneous resistance
Rtotal = Total vessel resistance
PEtotal = Total effective power

* = Exceeds speed parameter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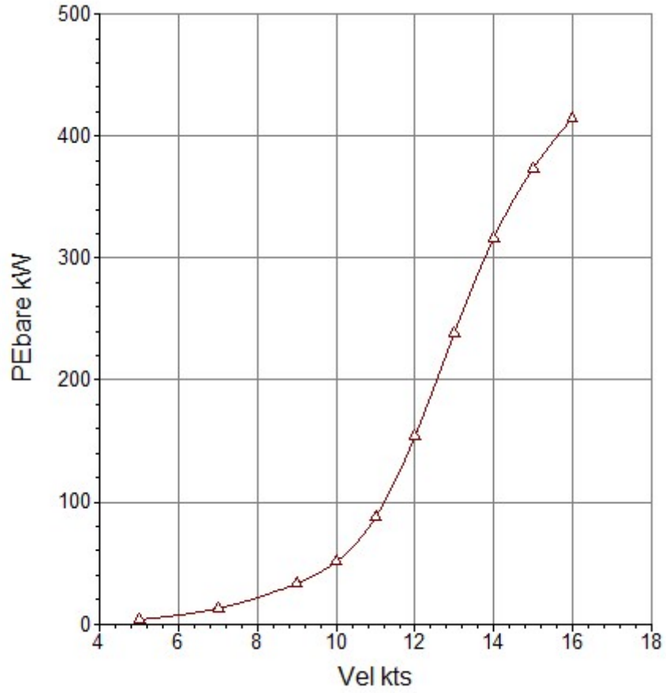
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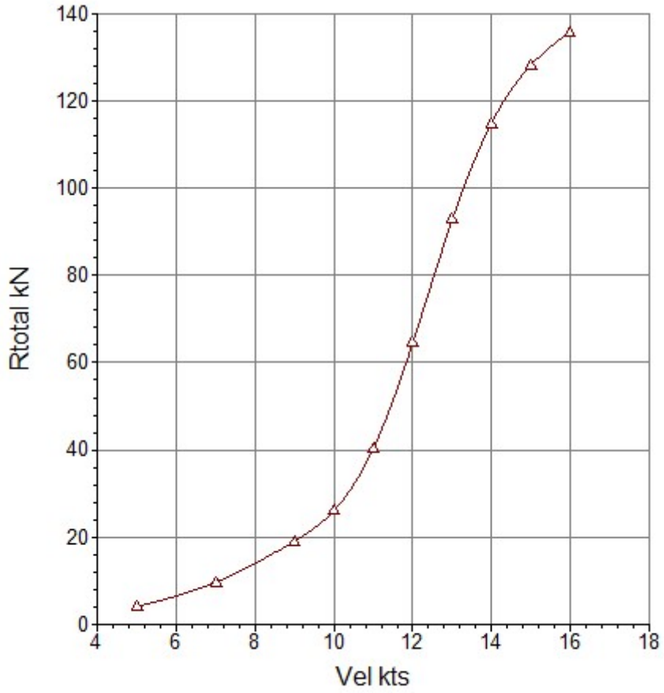
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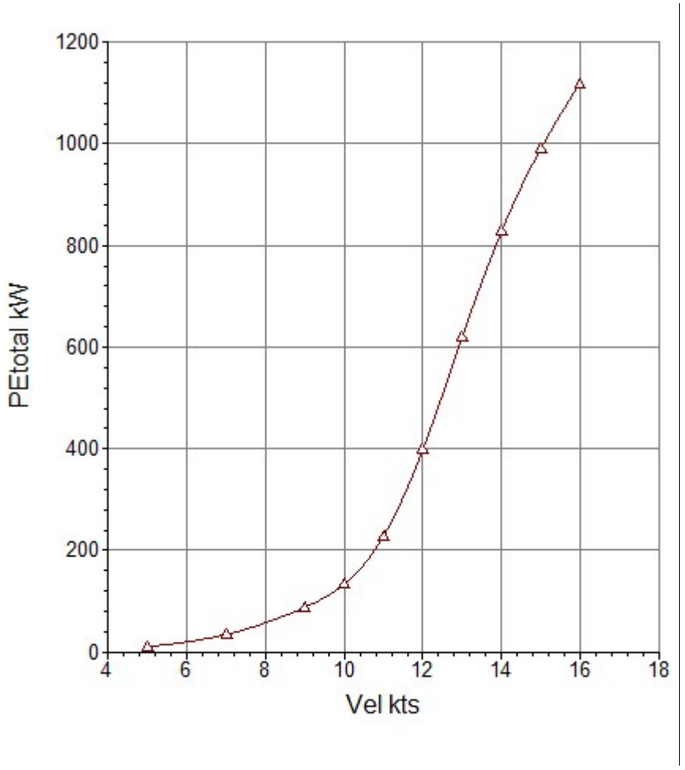
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