

<b>BOAT</b>
Name <b>ASTRAL</b>
Sail Nr <b>8675</b>

<b>GPH</b>
<b>616,2</b>

<b>HULL</b>	
Length Overall	<b>10,970 m</b>
Maximum Beam	<b>3,624 m</b>
Displacement	<b>6.034 kg</b>
Draft	<b>2,178 m</b>
IMS Reg. Division	<b>Performance</b>
Dynamic Allowance	<b>0,000%</b>
Fwd Accommodation	<b>Yes</b>
Hull Construction	<b>Solid</b>
Carbon Rudder	<b>No</b>
Crew Arm Extension	
IMS L	<b>10,176</b>
VCGD	<b>0,070</b>
VCGM	<b>0,093</b>
Sink	<b>20,66 kg/mm</b>
Wetted Area	<b>27,28 m<sup>2</sup></b>



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**2014**  
ORC International  
Certificate

<b>GENERAL</b>
Class <b>DUFOUR 36</b>
Designer <b>Um berto Felci</b>
Builder <b>DUFOUR</b>
Series <b>06/2012</b>
Age <b>06/2012</b>
Age Allowance <b>0,065%</b>
Offset File <b>duf36E-n.off - 17/6/2014 02:02:28</b>
Measurement by <b>Anderson - 26/11/2013</b>

<b>SCORING OPTIONS</b>						
	<b>OFFSHORE</b>			<b>INSHORE</b>		
	<b>COASTAL / LONG DISTANCE</b>			<b>WINDWARD / LEEWARD</b>		
Time On Distance	<b>596,8</b>			<b>664,5</b>		
Time On Time	<b>1,0054</b>			<b>1,0158</b>		
Performance Line	PLT	PLD		PLT	PLD	
	<b>0,835</b>	<b>91,1</b>		<b>0,777</b>	<b>148,6</b>	
Triple Number	Low	Medium	High	Low	Medium	High
	<b>0,9401</b>	<b>1,2432</b>	<b>1,4161</b>	<b>0,7218</b>	<b>1,0053</b>	<b>1,1913</b>

**Rating Office**

Offshore  
Racing  
Congress



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<b>TIME ALLOWANCES</b>							
Wind Velocity	6 kt	8 kt	10 kt	12 kt	14 kt	16 kt	20 kt
Beat VMG	<b>1080,4</b>	<b>886,0</b>	<b>777,7</b>	<b>705,8</b>	<b>675,0</b>	<b>660,3</b>	<b>651,8</b>
52°	<b>701,8</b>	<b>584,1</b>	<b>519,0</b>	<b>488,0</b>	<b>475,3</b>	<b>470,0</b>	<b>466,5</b>
60°	<b>659,3</b>	<b>552,3</b>	<b>500,2</b>	<b>476,0</b>	<b>462,6</b>	<b>456,3</b>	<b>451,8</b>
75°	<b>627,0</b>	<b>529,9</b>	<b>488,2</b>	<b>467,4</b>	<b>450,6</b>	<b>436,5</b>	<b>424,0</b>
90°	<b>620,8</b>	<b>516,3</b>	<b>476,8</b>	<b>465,4</b>	<b>451,3</b>	<b>436,4</b>	<b>405,9</b>
110°	<b>624,5</b>	<b>515,2</b>	<b>473,2</b>	<b>447,5</b>	<b>425,3</b>	<b>413,4</b>	<b>395,1</b>
120°	<b>643,4</b>	<b>528,3</b>	<b>479,9</b>	<b>454,2</b>	<b>429,1</b>	<b>404,6</b>	<b>380,4</b>
135°	<b>717,3</b>	<b>580,6</b>	<b>506,9</b>	<b>473,5</b>	<b>450,3</b>	<b>426,6</b>	<b>380,0</b>
150°	<b>857,5</b>	<b>678,9</b>	<b>572,4</b>	<b>506,3</b>	<b>474,4</b>	<b>451,9</b>	<b>407,1</b>
Run VMG	<b>990,1</b>	<b>783,9</b>	<b>660,1</b>	<b>574,7</b>	<b>515,4</b>	<b>480,4</b>	<b>435,8</b>
<b>Selected Courses</b>							
Windward / Leeward	<b>1035,2</b>	<b>835,0</b>	<b>718,9</b>	<b>640,3</b>	<b>595,2</b>	<b>570,4</b>	<b>543,8</b>
Circular Random	<b>859,4</b>	<b>689,6</b>	<b>597,3</b>	<b>542,9</b>	<b>509,1</b>	<b>486,9</b>	<b>459,0</b>
Ocean for PCS	<b>915,4</b>	<b>720,0</b>	<b>610,5</b>	<b>543,6</b>	<b>499,6</b>	<b>468,4</b>	<b>423,2</b>
Non Spinnaker	<b>931,9</b>	<b>740,6</b>	<b>635,0</b>	<b>571,7</b>	<b>532,0</b>	<b>506,2</b>	<b>475,2</b>

<b>Certificate</b>
Number <b>274300</b>
ORC Ref <b>AUS00050419</b>
Issued On <b>17/6/2014</b>
VPP Ver. <b>2014 1.01</b>
Valid until <b>30/6/2015</b>

<b>Crew Weight</b>
Declared <b>830 kg</b>
Default* <b>693 kg</b>
Non Manual Pwr <b>No</b>

<b>Special Scoring</b>
ToD ToT
Double H.GPH <b>619,3 0,9689</b>
Double H.OSN <b>601,5 0,9974</b>
Non Spin GPH <b>656,2 0,9144</b>
Non Spin OSN <b>632,3 0,9490</b>
N/S Perf. Line <b>55,2 0,731</b>

<b>Sails Limitations</b>		
Genoa <b>0</b>	Jibs <b>4</b>	Spinnakers <b>3</b>
Spinnaker configuration <b>Symmetric</b>		

<b>Velocity Prediction in Knots for True Wind Speeds</b>							
Wind Velocity	6 kt	8 kt	10 kt	12 kt	14 kt	16 kt	20 kt
Beat Angles	<b>43,7°</b>	<b>42,3°</b>	<b>41,9°</b>	<b>40,5°</b>	<b>39,3°</b>	<b>38,5°</b>	<b>38,3°</b>
Beat VMG	<b>3,33</b>	<b>4,06</b>	<b>4,63</b>	<b>5,10</b>	<b>5,33</b>	<b>5,45</b>	<b>5,52</b>
52°	<b>5,13</b>	<b>6,16</b>	<b>6,94</b>	<b>7,38</b>	<b>7,57</b>	<b>7,66</b>	<b>7,72</b>
60°	<b>5,46</b>	<b>6,52</b>	<b>7,20</b>	<b>7,56</b>	<b>7,78</b>	<b>7,89</b>	<b>7,97</b>
75°	<b>5,74</b>	<b>6,79</b>	<b>7,37</b>	<b>7,70</b>	<b>7,99</b>	<b>8,25</b>	<b>8,49</b>
90°	<b>5,80</b>	<b>6,97</b>	<b>7,55</b>	<b>7,74</b>	<b>7,98</b>	<b>8,25</b>	<b>8,87</b>
110°	<b>5,76</b>	<b>6,99</b>	<b>7,61</b>	<b>8,04</b>	<b>8,47</b>	<b>8,71</b>	<b>9,11</b>
120°	<b>5,60</b>	<b>6,81</b>	<b>7,50</b>	<b>7,93</b>	<b>8,39</b>	<b>8,90</b>	<b>9,46</b>
135°	<b>5,02</b>	<b>6,20</b>	<b>7,10</b>	<b>7,60</b>	<b>7,99</b>	<b>8,44</b>	<b>9,47</b>
150°	<b>4,20</b>	<b>5,30</b>	<b>6,29</b>	<b>7,11</b>	<b>7,59</b>	<b>7,97</b>	<b>8,84</b>
Run VMG	<b>3,64</b>	<b>4,59</b>	<b>5,45</b>	<b>6,26</b>	<b>6,99</b>	<b>7,49</b>	<b>8,26</b>
Gybe Angles	<b>139,9°</b>	<b>148,9°</b>	<b>151,9°</b>	<b>160,2°</b>	<b>174,0°</b>	<b>178,3°</b>	<b>178,1°</b>

<b>Storm Sails Areas</b>
Heavy Weather Jib <b>27,38</b>
Storm Jib (JL=9,26) <b>10,14</b>
Storm Try sail <b>12,03</b>

<b>Owner</b>

<b>BOAT</b>	
Name <b>ASTRAL</b>	Sail Nr <b>8675</b>
File <b>(0)</b>	Data in <b>meters/kilograms</b>

<b>INCLINING TEST AND FREEBOARDS</b>		
Inclining Test <b>Current Inclining</b>		
Flotation date <b>26/11/2013</b>	SG <b>1,0240</b>	
FFM <b>1,435</b>	FF <b>1,431</b>	SFFP <b>0,273</b>
FAM <b>1,200</b>	FA <b>1,209</b>	SAFP <b>10,725</b>
W1 <b>21,000</b>	PD1 <b>61,0</b>	WD <b>11,530</b>
W2 <b>42,000</b>	PD2 <b>122,0</b>	GSA <b>19,4</b>
W3 <b>63,000</b>	PD3 <b>182,0</b>	RSA <b>6400,0</b>
W4 <b>84,000</b>	PD4 <b>243,0</b>	PLM <b>2040,0</b>
LCF from stem on CL / on sheer		<b>5,977 / 6,210</b>
Maximum beam station from stem		<b>7,678</b>
RM Measured / Default		<b>142,0 / 149,4</b>
Limit of positive stability / Stab.Index		<b>119,6° / 121,1</b>
Freeboard at mast at 4,010		<b>1,294</b>



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IMS Measurement  
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<b>RIG</b>				
Forestay Tension <b>Aft</b>	Spreaders <b>2</b>			
Inner Stay <b>None Fitted</b>	Runners <b>0</b>			
Carbon Mast <b>No</b>	Jumper Struts <b>None</b>			
Taper Hollows <b>No</b>	Jib Furler <b>No</b>			
Fiber Rigging <b>No</b>	Main Furler <b>No</b>			
Lenticular Rigging <b>No</b>	Without Backstay <b>No</b>			
Articulated Bowsprit <b>No</b>				
P <b>14,000</b>	E <b>4,910</b>	MDT1 <b>0,104</b>	MW <b>0,180</b>	
IG <b>14,153</b>	J <b>4,010</b>	MDL1 <b>0,180</b>	GO <b>0,205</b>	
ISP <b>15,683</b>	SFJ <b>0,000</b>	MDT2 <b>0,104</b>	BD <b>0,160</b>	
BAS <b>1,643</b>	SPL <b>4,715</b>	MDL2 <b>0,180</b>	MWT	
FSP <b>0,064</b>	TPS <b>4,715</b>	TL <b>0,000</b>	MCG	

<b>PROPELLER</b>		
Installation <b>Strut</b>	PRD <b>0,450</b>	
Type <b>Folding</b>	PBW <b>0,130</b>	
Twin Screw <b>No</b>	PIPA <b>0,0039</b>	
ST1 <b>0,065</b>	ST3 <b>0,180</b>	ST5 <b>0,310</b>
ST2 <b>0,180</b>	ST4 <b>0,110</b>	EDL <b>3,070</b>

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<b>MIZZEN RIG AND SAILS</b>	
N/A	

<b>MOVEABLE BALLAST</b>		
N/A		

<b>COMMENTS</b>	

<b>CENTERBOARD</b>	
N/A	



Invalid for racing

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<b>SAILS (Maximum Areas)</b>						
Mainsail	HB	MGT	MGU	MGM	MGL	Area Area (r) Formula
	0,160	1,04	1,75	3,17	4,10	40,59 41,37 P/8 · (E + 2·MGL + 2·MGM + 1.5·MGU + MGT + 0.5·HB)
Symmetric	SL	SMG	SF			
	16,00	8,10	8,30	108,53	SL · (SF + 4·SMG) / 6	
Asymmetric	Not Available					

<b>HEADSAILS</b>												
Area = 0.1125·JL·(1.445·LPG+2·JGL+2·JGM+1.5·JGU+JGT+0.5·JH)												
JH	JGT	JGU	JGM	JGL	LPG	JL	Area	Btn	Fly	Meas.Date	Material	Comment
0,09	0,62	1,20	2,25	3,29	4,31	14,06	31,28			16/10/2012	Unknow	
0,11	0,61	1,16	2,23	3,33	4,39	13,90	31,07			26/11/2013	Carbon	

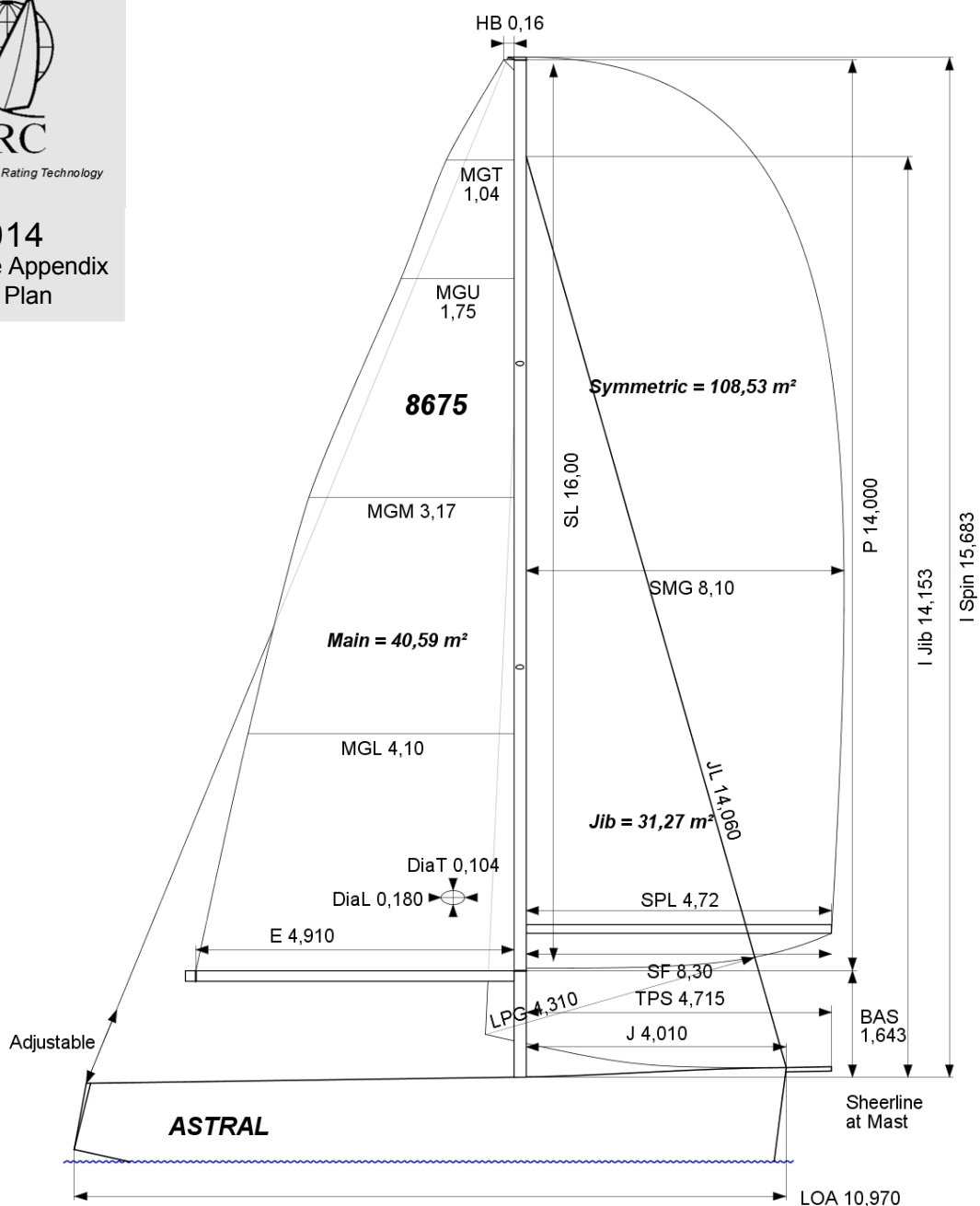
<b>MEASUREMENT INVENTORY</b>				
Measurer <b>Anderson 2015</b>				
Date <b>26/11/2013</b>				
Comment				
<i>Id</i>	<i>Item</i>	<i>Weight</i>	<i>Distance</i>	<i>VCG Description</i>
<i>Id</i>	<i>Item</i>	<i>Maker</i>	<i>Model</i>	
1	Engine	VOLVO	30hp	D1-30
<i>Id</i>	<i>Item</i>	<i>Weight</i>	<i>Distance</i>	<i>VCG Description</i>

<b>MEASUREMENT INVENTORY</b>						
<i>Id</i>	<i>Item</i>	<i>Tank Use</i>	<i>Tank Type</i>	<i>Capcty</i>	<i>Dist.</i>	<i>VCG Condtm Description</i>
5	Tank	H/W	S/S	20,0	8,50	0,0
4	Tank	HOLDING	PLASTIC	40,0	9,00	0,0
3	Tank	FUEL	PLASTIC	90,0	8,50	60,0
2	Tank	WATER	PLASTIC	100,0	5,30	0,0
1	Tank	WATER	PLASTIC	100,0	5,30	0,0
<i>Id</i>	<i>Item</i>	<i>Weight</i>	<i>Distance</i>	<i>VCG Description</i>		
2	Battery	60,0	8,50	2 X 12v	SEALED	
1	Battery	30,0	8,50	1 X 12v	SEALED	
1	Misc	20,0	7,00	OVEN		



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2014  
Certificate Appendix  
Sail Plan



SAILS INVENTORY																
MAINSAIL																
Id	HB	MGT	MGU	MGM	MGL	Area	Measurer	Meas.Date	Manufacture	Material	Comment					
1	0,160	1,04	1,75	3,17	4,10	40,59	Anderson	26/11/2013	North	Carbon						
HEADSAILS																
Id	JH	JGT	JGU	JGM	JGL	LPG	JL	Ovrlp	Area	Btn	Fly	Measurer	Meas.Date	Manufacture	Material	Comment
1	0,09	0,62	1,20	2,25	3,29	4,31	14,06	107%	31,28			Anderson	16/10/2012	North	Unknow	
2	0,11	0,61	1,16	2,23	3,33	4,39	13,90	109%	31,07			Anderson	26/11/2013	North	Carbon	
SYMMETRIC SPINNAKERS																
Id	SL	SMG	SF	Area	Measurer	Meas.Date	Manufacture	Material	Comment							
1	16,00	8,10	8,30	108,53	Anderson	26/11/2013	North	Nylon								
2	15,90	8,20	8,04	108,23	Anderson	16/10/2012	North	Nylon								
ASYMMETRIC SPINNAKERS																
Id	SLU	SLE	ASL	AMG	ASF	Area	Kind	Measurer	Meas.Date	Manufacture	Material	Comment				