

# UL 240



Stability calculation according to ISO 12217-3-2017 Small craft Stability and buoyancy assessment

By Xiamen DAWN DESIGN

Company: 厦门道恩建筑设计有限公司

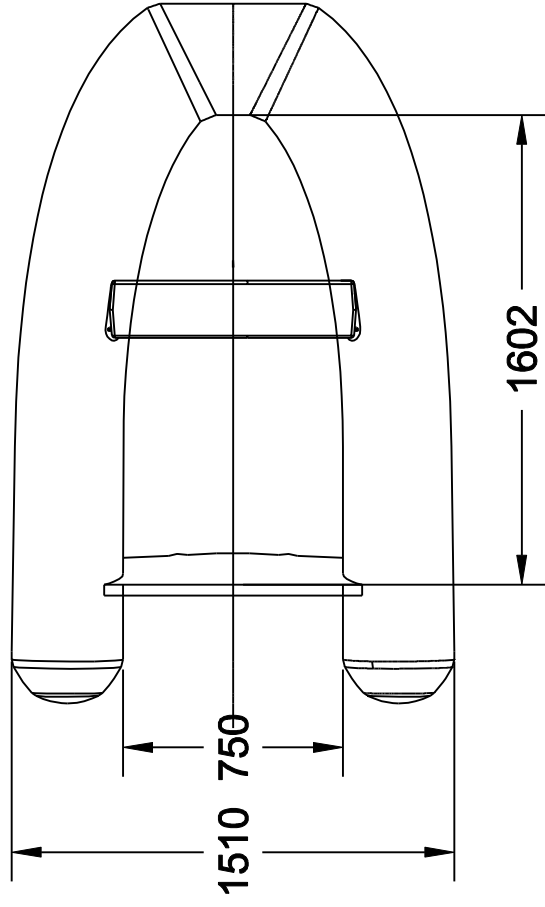
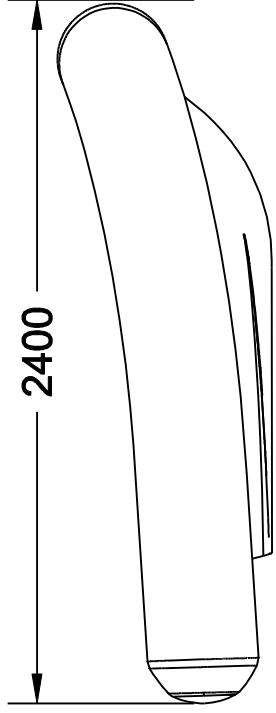
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 DAWN YACHT DESIGN 厦门道恩建筑设计有限公司	<b>ITEM</b>		PROJECT:	UL 240	
	<b>UL 240</b>		Cat.	cat. C	
	Signature		REV.	PAPER	SCALE
Design by			R2	A4	
Checked by			sheet 1 of 8		
Technic by					
Approved by		DATE	2018.05		


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**SPECIFICATION**

Loa 2400mm  
 Beam 1510mm  
 Inside Length 1602mm  
 Inside Width 750mm  
 Weight 29Kg  
 Max Pax 3  
 Max Load 290Kg  
 Max HP 4  
 Shaft Short  
 Tube 38cm  
 Airtight Chambers 3

	<b>Drawing Title</b>		Project Name: <b>UL240</b>	
	General Arrangement		Drawing NO.: <b>26-01-01</b>	
Signature		PAPER	SCALE	
Design by <b>S.C/L</b>		A4	1:25	
Checked by		SHEET	1	of 1
Technic by				
Approved by				
DATE	2017.04.19			

UL240 Weight			
Weight of the boat	29	kg	
Weight of the motor	40.9	kg	
test load	150.75	kg	3 passengers
TOTAL test mass:	<b>220.65</b>	kg	

The total test load  $m_t$ , in kilograms, shall be calculated using the following formula:

$$m_t = (0,67 \times n \times 75) + (0,67 \times 37,5) \text{ for a child, if applicable}$$

$n$  is the maximum permissible number of adults determined by the manufacturer (see 6.1), i.e. 75 kg for each permissible adult and 37,5 kg for a child, if applicable.

# Maximum power

This is applicable to Type II boats only.

— For boats without a transom:  $P_{\max} = 0,8F(d)$

— For boats with a transom:  $P_{\max} = 1,2F(d)$

where

$P_{\max}$  is the maximum motor power rating, in kilowatts, determined in accordance with ISO 8665;

$F(d)$  is the dimensional factor  $= l \times b$

where

$l$  is the overall length of the boat, in metres, from the bow to the extremity of the rear float (excluding handholds or other fittings);

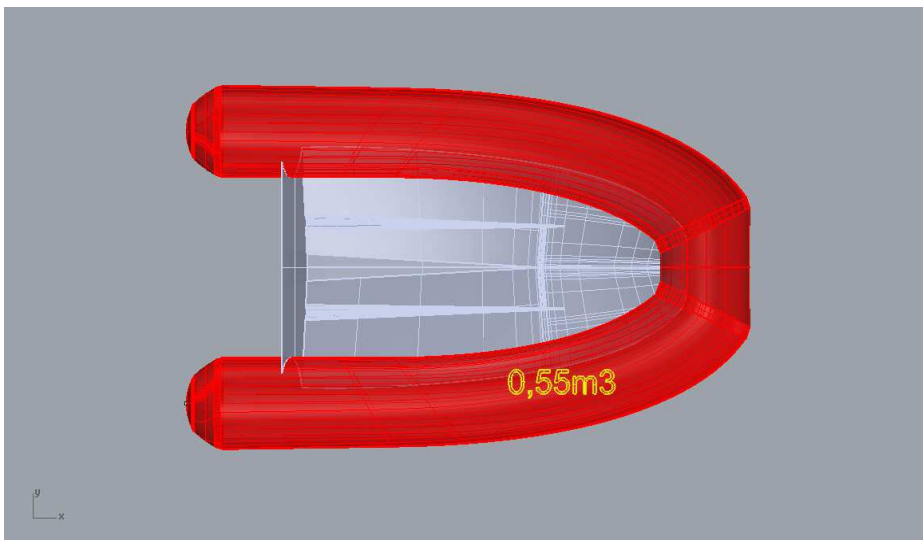
$b$  is the overall beam of the boat, in metres (excluding handholds or other fittings).

	l(m)	b(m)	Pmax Kw	Pmax HP
UL 240	2.39	1.510	4.33	<b>5.81</b>

# UL240 Buoyancy

Inflatable Buoyancy tube:

**0.55 m<sup>3</sup>**



# Maximum Load

- For Types I and III:  $m = (0,5 \times V \times 1\,000) - M$
- For Types II and IV:  $m = (0,75 \times V \times 1\,000) - M$

where

- $m$  is the maximum load capacity, in kilograms (total mass on board including persons, equipment, outboard motor(s) and fuel);
- $V$  is the volume, in cubic metres, of the buoyancy of the boat;
- $M$  is the total mass, in kilograms, of the boat as supplied by the manufacturer (inclusive of all permanently installed equipment supplied with the boat: hull, fittings and similar items but without outboard motor(s) and fuel). Permanently installed engine(s) and drive systems shall also be included.

Buoyancy volume (m <sup>3</sup> )	M (kg)	m (kg)	Max load recommended by manufacturer:
m <sup>3</sup>	kg	kg	kg
0.55	29	383.5	290

## Maximum number of passengers

$$n = \frac{l_i}{0,38} - 1$$

where  $l_i$  is the inboard length, in metres.

Under no circumstances shall the value,  $n$ , expressed in body mass, exceed the maximum load capacity (see 6.4).

The value  $n$  shall always be rounded down to the nearest integer but, if the first decimal place is greater than 5, a child may be added, or if greater than 7, an adult may be added.

For calculations, the body mass of a child is defined as 37,5 kg and the body mass of an adult as 75 kg.

The data displayed on the builder's plate(s), see clause 8 e), shall include at least one adult and not more than one child.

	$l_i$	n		N. persons
UL 240	1.6	3.211		3

# Hydrostatics Report

Length Overall, LOA	2.400	m
$L_H =$	2.400	m
Beam Overall, Boa	1.510	m
Waterline Length, Lwl	1.966	m
Waterline Beam, Bwl	1.505	m
Navigational Draft, T	0.198	m
Displacement Weight	220.650	kgf
Volume	0.215	m <sup>3</sup>
LCG	0.370	m
TCG	0.000	m
VCG	0.390	m
Fluid Density	1025.000	kg/m <sup>3</sup>
LCB	0.367	m
TCB	0.334	m
VCB	0.128	m
Wetted Surface Area	2.474	m <sup>2</sup>
Waterplane Area, Awp	2.038	m <sup>2</sup>
LCF	0.433	m
TCF	0.000	m
Weight To Immerse	20.913	kgf/cm
I(transverse)	0.361	m <sup>4</sup>
I(longitudinal)	0.425	m <sup>4</sup>
BMt	1.680	m
BMI	1.974	m
GMt	1.419	m
GMI	1.713	m
Mt	1.615	m
MI	1.909	m
Heel Angle	0.000	deg
Trim Angle	-0.575	deg
Cb	0.368	
Cwp	0.689	
Cvp	0.534	
Cws	3.805	

# Offset load test simulation

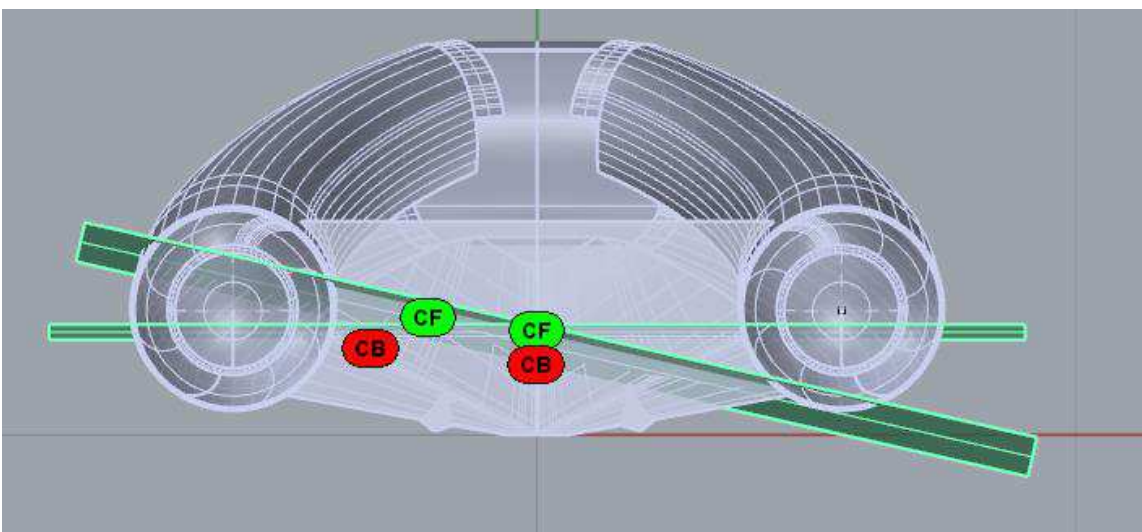
## 1. Test condition

	weight(kg)	x (mm)	y(mm)	z(mm)	Mx	My	Mz
boat	69.9	370	0	206	25863	0	14399.4
load	150.75	370	375	470	55777.5	56531.3	70852.5
	<b>220.65</b>	370.0	256.2	386.4	<b>81640.5</b>	<b>56531.3</b>	<b>85251.9</b>

## 1. General

Length Overall, LOA	2.400	m
$L_H =$	2.400	m
Beam Overall, Boa	1.510	m
Waterline Length, Lwl	1.911	m
Waterline Beam, Bwl	1.387	m
Navigational Draft, T	0.275	m
Displacement Weight	220.650	kgf
Volume	0.215	m <sup>3</sup>
LCG	0.370	m
TCG	0.256	m
VCG	0.390	m
Fluid Density	1025.000	kg/m <sup>3</sup>
LCB	0.364	m
TCB	0.308	m
VCB	0.159	m
Wetted Surface Area	2.214	m <sup>2</sup>
Waterplane Area, Awp	15.904	m <sup>2</sup>
LCF	0.521	m
TCF	0.201	m
Weight To Immerse	15.904	kgf/cm
I(transverse)	0.187	m <sup>4</sup>
I(longitudinal)	0.325	m <sup>4</sup>
BMt	0.872	m
BMI	1.512	m
GMt	0.635	m
GMI	1.275	m
Mt	0.789	m
MI	1.428	m
Heel Angle	-12.715	deg
Trim Angle	-1.497	deg

## 2. Test



Water does not enter into the boat.