



# 12

## INTERNATIONAL TWELVE METRE CLASS

Yacht's Name Lionheart

National letters and Sail Number K 18 Club New York Yacht Club

Designer Ian Howlett

Builder Joyce Marine Building Year 1978

Owner Harry H Graves

Owner's Address 2825 Pond Run Road Cincinnati, OH 45157 USA

Lloyds R class certificate (Number or Date) \_\_\_\_\_

### APPENDIX E RATING CERTIFICATE

This yacht has been measured by measurer(s) appointed by the International Twelve Metre Association and has been found to rate not more than 12.000 metres.


This certificate is dated September 20, 2016

Measurer A Williams Signature Ander

Valid until September 20, 2018

Supersedes September 15, 2009

Signature [Signature]  
ITMA Technical Director

  
Stamp of Authority of the  
International Twelve Metre Association

## RATING CALCULATION

**OVERALL LENGTH**

Overhang Forward to L1	1.860	
Overhang Aft to L1	2.060	
Total Overhang (Subtract)	3.920	<b>19.451</b>

**MEASURED LENGTH (L1 L1)**

Girth at Bow	1.460	
Twice vertical Height at Bow (Subtract)	1.200	
O at Bow	0.260	
Add 1 1/2 O at Bow (min 0.540 m)	<b>0.540</b>	<b>15.531</b>
Girth at Stern	3.205	
Twice vertical Height at Stern (Subtract)	1.802	
O at Stern	1.403	
Add 1/3 O at Stern (min 0.400 m)	<b>0.468</b>	
Add any penalty (Beam)	<b>0.000</b>	
Sum of Length and Girth Corrections		<b>16.539</b>
Age Date and Allowance	1978	Allowance <span style="border: 1px solid black; padding: 0 10px;">0.9867</span>

**CORRECT LENGTH L**

Skin d to d1 Port	2.100	
Chain d to d1 Port	2.100	
d Port	0.000	
Skin d to d1 Starboard	2.099	
Chain d to d1 Starboard	2.099	
d Starboard	0.000	
Add d	0.000	

**Add GIRTH 2 d**

Mean Freeboard Bow O		Actual	1.212	1.367	
Mean Freeboard Midship d		Actual	1.139	1.139	Limit used
Mean Freeboard Stern O		Actual	1.081	1.000	Limit used
Sum of Freeboards				3.506	

**Subtract FREEBOARD, F****Add SAIL AREAS (Square root)****TOTAL OF MEASUREMENTS**

		<b>1.169</b>
		<b>13.290</b>
		<b>28.440</b>

PENALTY (Draught )

0.000

**RATING****12.000**

Date and place of Measurement

September 20, 2016

Measurer's Name(s)

A Williams

Signature



## PENALTIES

Overhang Forward to L	2.450	
Overhang Aft to L	2.555	
Subtract from overall length	5.005	
Difference of immersion from salt to fresh water	0.000	

**WATERLINE LENGTH**

Minimum Displacement for Zero Penalty [m3]	28.070	<b>14.446</b>
Minimum Weight for Zero Penalty [tonnes] (Water of sg 1.025)	28.772	

**ACTUAL WEIGHT [tonnes]**

Equivalent LWL (for Displ. < min.)	14.524	<b>29.219</b>
Difference		
DISPLACEMENT PENALTY (add to L)		<b>0.000</b>

**DRAUGHT (actual)**

Max. Draught for Zero Penalty	2.810	
Difference (if positive)	2.811	
DRAUGHT PENALTY (add to Rating)		<b>0.000</b>

**BEAM (Min)**

Max Beam at 1/3 of Midship Freeboard	3.602	
Difference (if positive)	3.600	
BEAM PENALTY (add to L)	0.002	<b>0.000</b>
Tumblehome Max. (2 x 2% of Extr. Beam)	0.000	
Extreme Beam	3.605	
Beam at deck	3.605	
Difference (if positive)	0.000	
TUMBLEHOME PENALTY (add to Rating)		<b>0.000</b>

Date and place of Measurement

September 20, 2016

Measurer's Name(s)

A Williams

Signature



## SAIL PLAN

Max Height of Sail Plan =	25.000	J=	7.340	I =	18.750
Boom Height =	1.237	A=	23.763	B=	9.755
Rated Mainsail Area	115.904	Spi boom=	7.620	√S=	13.290
Rated Foretriangle Area	60.722	Propeller allowance	1.000		
TOTAL RATED SAIL AREA	176.626	Corrected sail area	176.626		

### SAIL LIMITS

Mainsail max girth:	1/2 height (68%)	6.633	3/4 height (41%)	4.000
Genoa:	max. foot length (J + 4.8m)	12.140		
Spinnaker:	1/2 foot max breadth (125% J)	9.525	max. luff length=	18.691

## Spar Measurement

MAST (material)	Aluminium	Mast Weight	517	CG pos.	10.480
Mast dimensions [mm]	Deck 363x248	Half-Height 361x244	Jib-Halyard 302x199	Head 199*121	
Sections area [cm <sup>2</sup> ]	707	691	472	189	

## Engine/Propeller Installation

Engine and propeller weight	none	Propeller diameter =	none
Minimum boat speed with engine	none	Propeller position =	none
Engine model and power	none		

## Flotation

Internal Ballast	Location from Bow
1 Lead Pigs 4 @ 26.25 kg = 105 kg	8.5m
2 Lead Pigs 16 @ 26.3 kg = 421 kgs	9.25m
3 Lead Pigs 2 @ 24 kgs = 48 kgs	12.1m

## Measurer's Notes

1	Freeboard in Rating as per 1976 Rule (Sum/3,Max 1.21)
2	New Boom 2009

Date and place of Measurement	September 20, 2016	Portsmouth RI USA
Measurer's Name(s)	A Williams	Signature