

18 JUN 1941

14050

Rpt. C.11 (Comp.).

Empire Gold 36403

Empire Granite 36451

Empire Oil

Empire Lica 36513

Empire Amethyst 36592

Lloyd's Register of Shipping.

SURVEYS FOR FREEBOARD.

(COMPUTATION FOR STEAMER, SAILING SHIP, TANKER.)

Ship's Name FURNESS S.B.C. LTD 7/329. "EMPIRE SAPPHIRE" ✓	Official Number 164847	Nationality and Port of Registry BRITISH MIDDELSBROUGH.	Gross Tonnage 8031.	Date of Build 1941.	Port of Survey MIDDELSBROUGH.
Moulded Dimensions: Length 460.0 ✓ Breadth 61.0 ✓ Depth 33.3 ✓ <i>5 cubic feet less 460.96</i>					Date of Survey WHILE BUILDING.
Moulded displacement at moulded draught = 85 per cent. of moulded depth 17665 ✓ tons TONS PER INCH. 58.16.					Surveyor's Signature Capt B. Leaver
Coefficient of fineness for use with Tables 778 ✓					Particulars of Classification 100.91. CARRYING PETROLEUM IN BULK. LONGITUDINAL FRAMING ON BOTTOM AND AS DECKS. CONTEMPLATED.

Depth for Freeboard (D).		Depth correction.		Round of Beam correction.	
Moulded depth ...	33.25 ✓	(a) Where D is greater than Table depth (D - Table depth) R = (33.31 - 30.73) x 3.0 = +7.74"	✓	Moulded Breadth (B)	61.0 ✓
Stringer plate ...	78 ✓	(b) Where D is less than Table depth (if allowed) (Table depth - D) R =	✓	Standard Round of Beam = $\frac{B \times 12}{50}$	14.64
Sheathing on exposed deck $T \left(\frac{L-S}{L} \right) =$		If restricted by superstructures	✓	Ship's Round of Beam	15 ✓
Depth for Freeboard (D) =	33.315			Difference Excess	36"
				Restricted to	
				Correction = $\frac{\text{Diff}^2}{4} \times \left(1 - \frac{S_1}{L} \right)$	= $\frac{36}{4} \times 58.09 = -0.5"$

DEDUCTION FOR SUPERSTRUCTURES.

	Mean Covered Length (S)	Equivalent Enclosed Length (S ₁)	Height	Height Correction	Effective Length (E)
Poop enclosed Equiv.	110.29	110.29	7.6 ✓	✓	110.29
overhang ...	110.29				
R.Q.D. enclosed					
overhang					
Bridge enclosed Equiv.	45.84	45.84	7.6 ✓	✓	45.84
overhang aft	45.84				
overhang forward	83				
Fore enclosed					
overhang	36.42	36.42	7.6 ✓	✓	36.42
Trunk aft	42				
forward					
Tonnage opening aft					
forward					
Total	193.38	193.17			193.17

Standard Height of Superstructure **7.5'** ✓
" " R.Q.D. ✓
Deduction for complete superstructure **42.00"**
Percentage covered $\frac{S}{L} =$ **41.95**
" " $\frac{S_1}{L} =$ **41.91**
" " $\frac{E}{L} =$ **41.91**
Percentage from Table, Line **Tanker = 32.91**
(corrected for absence of forecastle (if required)) ✓
Percentage from Table, Line B. ✓
(corrected for absence of forecastle (if required)) ✓
Interpolation for bridge less than .2L (if required) ✓
Deduction = **42.00 x 32.91 = -13.82"**

SHEER CORRECTION.

Station	Standard Ordinate	S	M	Product	Actual Ordinate	Effective Ordinate	S	M	Product
A.P. ...	56.10	1	56.10	60.25	60.25	1	60.25		60.25
$\frac{1}{2}$ L from A.P. ...	14.96	4	99.84	26.50	26.50	4	106.00		106.00
$\frac{2}{3}$ L " ...	6.17	2	12.34	6.625	6.625	2	13.25		13.25
Amidships ...		4				4			
$\frac{2}{3}$ L from F.P. ...	12.34	2	24.68	11.50	11.50	2	23.00		23.00
$\frac{1}{2}$ L " ...	49.915	4	199.70	51.00	51.00	4	204.00		204.00
F.P. ...	112.19	1	112.19	114.00	114.00	1	114.00		114.00
Total			504.85				570.50		

Mean actual sheer aft = **Excess**
Mean standard sheer aft
Mean actual sheer forward = **Excess**
Mean standard sheer forward
Length of enclosed superstructure forward of amidships = **Tanker**
" " aft of " = **Tanker**
Correction = $\frac{\text{Difference between sums of products}}{18} \left(\frac{75-S}{2L} \right) = \frac{15.65}{18} \left(\frac{75-2097}{5403} \right) = -47"$
If limited on account of midship superstructure. ✓
If limited to maximum allowance of $1\frac{1}{2}$ ins. per 100 ft. ✓

Deduction for Tropical Freeboard.	Deduction for Fresh Water.	TABULAR FREEBOARD corrected for Fresh Deck (if required)	77.94
Addition for Winter and Winter North Atlantic Freeboard.	Displacement in salt water at summer load water line	Correction for coefficient	83.55
Depth to Freeboard Deck = 33.31	$\Delta =$ 16810	778 + .68 = 1.458 / 1.36	
Summer freeboard = 6.42	Tons per inch immersion at summer load water line	Depth Correction ...	7.74
Moulded draught (d) = 26.89	T = 57.0	Deduction for superstructures ...	13.82
Deduction for Tropical freeboard and addition for Winter freeboard = $\frac{d}{4}$ inches = 6.72 = 6$\frac{3}{4}$"	Deduction = $\frac{\Delta}{40T}$ inches = 7.37	Sheer correction ...	47
Addition for Winter North Atlantic Freeboard (if required) = 6.72 + 4.61 = 11.33 = 11$\frac{1}{4}$"	= 7$\frac{1}{4}$"	Round of Beam correction ...	0.5
		Correction for Thickness of Deck amidships ...	
		Other corrections, scantlings, etc. ...	
		Summer Freeboard = 76.95	

SUMMER FREEBOARD amidships from Centre of Disc to top of Deck Line, Wood, Steel, Deck:

Tropical Fresh Water Line above Centre of Disc	... 14"
Fresh Water Line	... 7$\frac{1}{4}$"
Tropical Line	... 6$\frac{3}{4}$"
Winter Line below	... 6$\frac{3}{4}$"
Winter North Atlantic Line	... 11$\frac{1}{4}$"

Tropical Fresh Water Freeboard	... 6$\frac{1}{2}$"
Fresh Water	... 5$\frac{1}{2}$"
Tropical	... 5$\frac{1}{2}$"
Winter	... 5$\frac{1}{2}$"
Winter North Atlantic	... 5$\frac{1}{2}$"

1500

[illegible]

part

Builder's name and yard number FURNESS S.B.C.L. N° 329. EMPIRE SAPPHIRE.

To BE CHARGED WITH FIRST ENTRY.

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