“Bulker Forebody Replacement Cost Model”

The “Bulker Forebody Replacement Cost Model” is an Excel workbook useful for estimating the forebody (from the engine room bulkhead and forward) replacement costs for bulk carrying ships. Each worksheet contains costs that belong to a particular category of costs such as steel work, piping, electrical, machinery, etc.

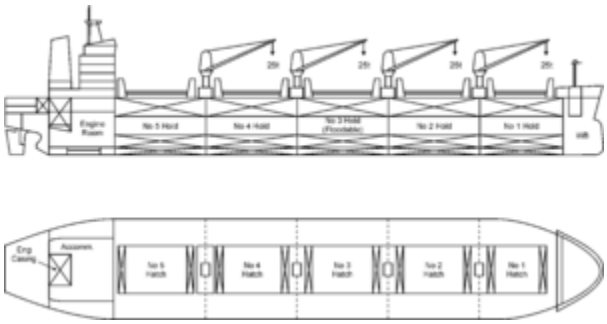

Figure 1: General Bulk Carrier

The cost model requires the user to enter data that define the basic ship characteristics (Figure 2) for the vessel being modified (the end-result vessel). If the user makes no entry in one of these cells, the cost model will substitute values from the list of model defaults. These defaults have been developed from a statistical analysis of various bulk carriers on the market.

> WARNING: these default values are based only on statistical data, not on a properly engineered determination for the given ship design being estimated. **The cost model does require the user to provide at least an overall length of the ship (LOA) in order for the default values to be generated.**

The cost model develops its cost estimate details using various ship dimensional factors. These factors relate size parameters of the vessel being estimated to a base set of forebody replacement costs. The resulting CERs should be regarded as representative of production costs for an average mid-size U.S. commercial shipbuilder.

Bulker Forebody Replacement Cost Model

Sample Forebody Replacement	Enter Ship Name							
	Metric Units		Computed	Bulker Baseline Size Factor			Model Default	R^2
Hull:	*Note 1*							
Length Over All (LOA)	225.50	M	225.50	1.00				
Length Between Perpendiculars (LPP)		M	217.15	0.98	96.3%	LOA	217.15	0.9995
Beam		M	35.38	1.49			35.38	0.9378
Depth		M	19.15	1.30			19.15	0.9732
Draft		M	13.56	1.68	70.8%	Depth	13.56	0.9401
DWT		MTONS	74,977.12	2.44			74,977	0.9739
Number of Holds		Holds	5	1.00			5	
Total Hold Capacity		CUM	86,161.36	2.14			86,161	0.9637
Length of Hold Section		M	127.17				127.17	
Length per Hold Hatch		M	25.43				25.43	
Cubic Number (CuNo = LPP x Beam x Depth)		CuNo	147,127.19	1.89				
Block Coefficient (Cb)		Cb	0.85				0.85	
SVI (LPP x Beam x Depth x Cb)		CUM	88,541					
Displacement =SVI /0.9754		MT	90,774					
			Estimated/					
Steel Work	*Note 2*		Computed					
Bow & Forecastle		MT	854.12				854.12	
Bulkhead		MT	196.42				196.42	
Double Bottoms		MT	1,714.98				1,714.98	
Hoppers		MT	1,012.38				1,012.38	
Lower Side Tanks		MT	1,387.26				1,387.26	
Transverse Decks		MT	462.68				462.68	
Upper Side Tanks		MT	2,022.86				2,022.86	
Bulbous Bow	10	MT	10.00				-	
User Defined Block		MT	-				-	
User Defined Block		MT	-				-	
User Defined Block		MT	-				-	
User Defined Block		MT	-				-	
User Defined Block		MT	-				-	
		Total MT	7,660.70					
		MT/CuNo	0.0521				0.0696	
		MT/LOA	33.97				24.0816	

Note 1: Enter ship characteristics of the vessel being estimated in the **gray cells** only.

Note 2: Enter estimated tonnes for each type of hull block in the **gray cells** only. If not entered,

Figure 2: Cost Model "Ship Characteristics" Worksheet

The cost model produces both labor hours and material cost estimates.

- The labor hours are based on productivity of a modern U.S. mid-level commercial shipbuilder.
- Material costs are cataloged with the originating known date. This data is called the base year and base year cost, which can be updated when more current costs are available for the CERs. These base year costs are automatically escalated to whatever date the user wishes to use for an estimate. The user must set the date (year) in the "Rates & Factors" worksheet. Setting this date automatically triggers the cost model work book to adjust all material base year costs throughout the workbook by applying escalation factors to the base year costs.

The cost model is similar in approach to other SPAR cost models, although it is much simpler due to the fact that a forebody replacement does not require too many ship systems and equipment.

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