

Generic Cost Estimating Relationships

Ship Repair & Overhaul
(Government & Commercial)

Rates based upon average mid-size U.S. shipyard having mid-1990's to 20xx production facilities.

Confidential & Proprietary Data

All material costs and equipment have been escalated for the year

2015

NOTE: To change material cost estimates to another year, insert that year above

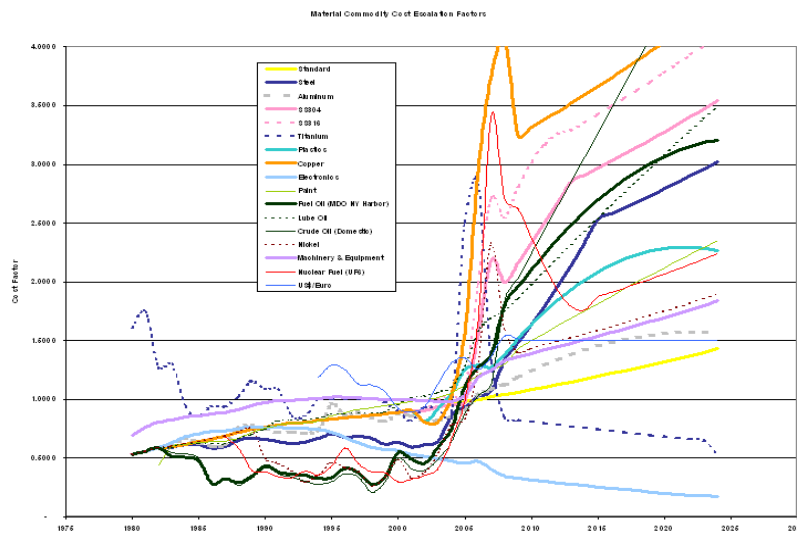


New Construction & Ship Repair Cost Libraries

SPAR's cost libraries are ready for estimating costs across a wide range of shipbuilding and repair applications and across a wide range of estimating planned years. The libraries (there are two, one for new construction and one for ship repair) contain cost estimating relationships (CERs) for shipyard labor hours and for material costs at various levels of detail from production processes to high level ship parameters. The CERs are provided with many different units of measure including weight, area, volume, length, and kW power as well as type material, type fabrication, and higher level units such as vessel ship type, displacement, cubic number, LOA, crew size and many other useful measures.

All material CERs are linked to appropriate commodity-based escalation tables that enable material costs to be adjusted consistently for any required year for an estimate. For example, different commodities historically have responded very differently to price changes. For example, steel prices have not been so erratic in price changes as has copper which affects electric cable more significantly. European machinery, electronic & equipment prices have been linked to the latest U.S. dollar to Euro and to British pound exchange rates.

These escalation tables help keep older costs to more current price levels to minimize the effort to maintain their usefulness.



Sample Display of SPAR's Commodity-Based Escalation Tables

SPAR's extensive CER libraries are continuously updated and expanded. The upgrades include revised commodity-based escalation tables that reflect current changes in prices for materials (steel, aluminum, paint, copper, fuels, etc.) and equipment.

These cost libraries are available for purchase either in the form of hard copy, Excel workbooks or pre-loaded into SPAR's *PERCEPTION® ESTI-MATE®* cost estimating system and database.

NOTICE

The Ship Repair Cost Estimating Relationships (CERs) should be regarded as representative of ship repair costs for an average mid-size U.S. commercial shipyard. The data contained herein should be regarded as only estimates of true costs and are based upon average costs experienced within the ship building industry.

Material costs have been summarized and escalated to a common, current year value. Variations due to specific materials, equipment models and configurations, and vendor pricing methods should be expected. Costs assume commercial grade shipbuilding materials and quality management.

These CERs are proprietary information and are protected by copyright. All rights reserved. The use of these CERs should be undertaken with the same care as any level of business information that approximates or simulates any real-world situation. The CERs are not advertised to guarantee an exact correlation with the actual costs that would ultimately be incurred.

The CER information provided is always subject to change without notice.

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Worksheet Name
(Hyperlinked)

New Construction CER Category

Major CER Categories

Coatings: Clean & Paint
 Dock Services
 Electric
 Engineering
 Hull Item Repairs
 Inspections
 Insulation: Remove & Install
 Machinery Repairs
 Miscellaneous
 Outfit: Joinerwork, Doors, Hatches & Scuttles
 Pipe & Fittings: Renew, Install, Bend, Replace, Insulate
 Productivity
 Shipyard Services
 Structural
 Tank Cleaning
 Welding Services
 Valve Servicing

Coatings - Paint Application	Paint
Coatings - Paint Cement Wash	Paint
Coatings - Paint Full Coat	Paint
Coatings - Paint Spot Coat	Paint
Coatings - Paint Copper Ablative	Paint
Coatings - Paint Epoxy/Vinyl	Paint
Coatings - Paint Zinc Silicate	Paint
Coatings - Paint Silicone Alkyd	Paint
Coatings - Paint Inspections & Testing	Paint
Coatings - Paint Hull Marks	Paint
Coatings - Scaffolding	Paint
Coatings - Clean w/Non-Hazardous Blast	BlastCleanCharts
Coatings - Clean w/ Hazardous Blast	BlastCleanCharts
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Coatings - Preservation Sea Chest & Strainer	Equations - Paint
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Structural Materials Prices - Stainless 304 & 316	Metals - Material Prices
Structural Materials Prices - HY80	Metals - Material Prices
Structural Materials Prices - HS Steel	Metals - Material Prices
Structural Materials Prices - Mild Steel	Metals - Material Prices
Structural Materials Prices - Ballast Material	Ballast Material
Tank Cleaning - Remove & Dispose Bilge Water	Tank Cleaning
Tank Cleaning - Remove & Dispose Fuel Oil	Tank Cleaning
Tank Cleaning - Remove & Dispose Oil Below Low Suction Level	Tank Cleaning
Tank Cleaning - Remove & Dispose Cleaning Slops	Tank Cleaning

2013 - NO LINKS - Generic Repairs CERs

Tank Cleaning - Install & Remove Oil Containment Boom	Tank Cleaning
Tank Cleaning - Fuel Tank to Safe Hot Work Condition	Tank Cleaning
Tank Cleaning - Bilge Clean & Wipe Down	Tank Cleaning
Tank Cleaning - Gas Free Certificates	Tank Cleaning
Welding Services - Bead-on-plate welding (lettering, numbering, stripe or	Equations-Welding
Welding Services - Burning, scarfing & flame cutting	Equations-Welding
Welding Services - Grinding or chiseling	Equations-Welding
Welding Services - NDT Testing of Welds	Equations-Welding
Welding Services - Welding - Bevel "V"	Equations-Welding
Welding Services - Welding - Fillet	Equations-Welding
Welding Services - Welding repairs: cracks (drill out & weld)	Equations-Welding
Welding Services - Welding repairs: overlay welding	Equations-Welding
Welding Services - Welding repairs: stud renewal (burn off only)	Equations-Welding
Welding Services - Welding repairs: stud renewal (burn off & weld)	Welding, Grinding, Burning
Welding Services - Welding rod, gas & flux	Welding, Grinding, Burning
Welding Services - Bead-on-plate welding (lettering, numbering, stripe or	Welding, Grinding, Burning
Welding Services - Bottom butt welding	Welding, Grinding, Burning
Welding Services - Bottom welding	Welding, Grinding, Burning
Welding Services - Burning, scarfing & flame cutting	Welding, Grinding, Burning
Welding Services - Butt welding	Welding, Grinding, Burning
Welding Services - Miscellaneous plate burning	Welding, Grinding, Burning
Welding Services - NDT Testing of Welds	Welding, Grinding, Burning
Welding Services - Simple bevel weld	Welding, Grinding, Burning
Welding Services - Simple fillet weld	Welding, Grinding, Burning
Welding Services - Single V-butt weld	Welding, Grinding, Burning
Welding Services - Welding per pass (average)	Welding, Grinding, Burning
Welding Services - Welding repairs: cracks (drill out & weld)	Welding, Grinding, Burning
Welding Services - Clad weld, grind smooth & two coatings	Welding, Grinding, Burning
Welding Services - Grinding or chiseling	Welding, Grinding, Burning
Welding Services - Manual Fillet Welding	Welding Rate Charts
Welding Services - Manual Bevel Welding	Welding Rate Charts
Welding Services - Manual Fillet Welding	Welding Tables
Welding Services - Manual Bevel Welding	Welding Tables
Valve Servicing - Globe Steam	Valve Inspection
Valve Servicing - Globe Water	Valve Inspection
Valve Servicing - Gate Water	Valve Inspection
Valve Servicing - Butterfly	Valve Inspection
Valve Servicing - Re-Furbishing Globe	Equations - Valves
Valve Servicing - Re-Furbishing Gate	Equations - Valves
Valve Servicing - Re-Furbishing Butterfly	Equations - Valves
Valve Servicing - Globe Sea Valve	Valve Work
Valve Servicing - Gate Sea Valve	Valve Work
Valve Servicing - Butterfly Sea Valve	Valve Work
Valve Servicing - Steam Valve	Valve Work
Valve Servicing - Globe Sea Valve	Valve Work Charts
Valve Servicing - Gate Sea Valve	Valve Work Charts
Valve Servicing - Butterfly Sea Valve	Valve Work Charts
Valve Servicing - Steam Valve	Valve Work Charts
Valve Servicing - Gate In-Line Disc	Inline Disc Gate Valve Work

